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The Function and Observation of Underground Activities

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Hidden economy is one of the most exciting parts of current economic research in Hungary, because its extent and gravity in management processes have also become dominant in the course of development of Hungarian capitalism. Hidden economy has a wide range of aspects, so it is difficult to define its actual order of magnitude.

Hidden economy is accompanied by the development and escalation of idiosyncratic Hungarian capitalism. It is an important cause of disproportions in economy and of deformations in society, especially of unequal competition, of overmuch liability in a broad population, and of extreme income and property deviation.

However, it is not obvious that hidden economy is always harmful, condemning, and must be persecuted. Hidden economy is, so to speak, iridescent, and its economic policy can be to find legalization possibilities, so that hidden economy shall be not more than 7-10 percent of GDP in Hungary. Dissolving and abolishing the economic causes of participation in hidden economy can be the solution for the problem. There is no doubt about rationalizing economic participants. If the profit is higher than the expected penalty of an almost (or a little bit) illegal activity, both companies and citizens will make the best of such a situation (estimating the penalty odds).

There are favourable and unfavourable features among the system-specific characteristics of capitalism, but changing of unfavourable features occasionally can have a bad influence on good practices and operation.

KEYWORDS:
Shadow economy.
Estimation.
Taxation.

Besides the increasingly strong criminal activities (somehow having an influence on every Hungarian citizen), the so called "soft types" of the hidden economy that are also accepted by social judgment have become general. These forms of the hidden economy are so varied nowadays that it is even difficult to collect and classify them. With this end in view, it is not hyperbolic that the rate of the hidden economy in Hungary could reach the 25-30 percent of GDP by the middle of 1990s. (This means approximately HUF 2 500-3 500 billion in the total GDP of HUF 11 580 billion calculated in current price in 1999.)

1. The concept of shadow economy

Similarly to other societies, Hungary can also be characterised by legal and illegal activities, visible and invisible – so to speak underground – spheres, silver grey, oxford-grey, and black economies, but their extension and range are quite different.

In some countries concealed, illegal and underground economies are sharply separated from each other. Certain economic activities are considered productive and legal, even if they are hidden from authorities, because of different tax or social insurance avoidance, and trespasses in connection with minimal payment, maximum man-hour, security and health or administrative regulations, statistical and other questionnaire faults.

The activities marked as hidden economy can be placed in the system of all human actions. For this, the Statistical Office of the European Communities developed a model that classifies and arranges all economic participants and their activities in different dimensions. The so called "black economy" is in the middle of this scheme, and this part of the economy can be also labelled as hidden economy, in accordance with the expression of several western countries and international institutions. The main reason for this is that the idea of the black economy is close to illegal wrongful or criminal acts, so it has a narrower context than interpretation of statistical offices. Hence, it is just a difference between terms. There is still an important semantic problem arisen between the definitions of production in System of National Accounts (SNA) and the delineated accrual. It is about the fixation of illegal activities that are part of production according to SNA, so it must be calculated in GDP, but as a part of "not measured production".

The considerable part of the "black economy" means activities that are profitable for some people, but can not be calculated in total GDP, because they are not derived from production. These corrupt, bribed, someway hot, or other wrongful incomes seem to be substantial in Hungary as well. Such criminal acts evidently do not raise the total available goods of a country; they only produce the redistribution of incomes and goods.

Studies on shadow economy show significant differences and sometimes contradictions in the definitions and methods they use as well as in the numerical results they arrive at. It all leads to errors in estimation and even bad economic decisions.

Experts of the topic include unreported and unmeasured economic activities in the concept of the shadow economy (*Feige* [1989]). They do this by applying the current regulations and techniques used for the observation of the economy. It is a "loose" definition that defines hidden activities outside the GDP by considering whether they belong there according to certain (UN and EU) regulations or they only fall outside the process of measuring. Shadow economy is "the marked-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP" (*Smith* [1994]), that is "… all currently unregistered activities that contribute to the officially calculated (or observed) GNP" (*Schneider* [2002a]). According to this definition shadow economy covers the total sum of all income-earning activities that avoid state regulations, taxation or observation (*Fleming–Roman–Farrel* [2000]).

Table 1

Types of underground economic activities

Type of activity	Monetary transactions		Nonmonetary transactions	
Illegal activities	Trade in stolen goods; drug dealing; prostitution; gambling; smuggling, fraud, etc.		Barter of drugs, stolen or smuggled goods, etc.; growing or producing drugs for own use; theft for own use.	
Legal activities	Tax evasion	Tax avoidance	Tax evasion	Tax avoidance
	Unreported income from self-employment; wages, salaries, and assets from unreported work related to legal services and goods	Employee discounts, fringe benefits	Barter of legal services and goods	Neighbour help

Source: *Lippert* and *Walker* [1997] with additional remarks by *Schneider* and *Klinglmair* [2004].

The most obvious and significant characteristic of these definitions is that they are based upon the definitions of calculating and estimating the GDP of a government or an international organization. This definition can change in time − as

it changed in the past. The most accurate approach is the System of National Accounts (1993) and its amendments that define the compounds of the hidden economy with great rigour (*UNO* [2007]).[1] These applied concepts and definitions have been used in the creation of the European System of National and Regional Accounts (ESA, 1995) that is also regularly reviewed and amended.

The activities, which belong to the shadow economy, are mostly related to the distribution of income regulated by the state. The return on the participants' co-operation is the amount of unreported tax they can share. It is also important that both the customers and the sellers are associates in crime and beneficiaries in most of the transactions. Participants in the shadow economy consider

– the amount of costs and profit of their hidden activities compared with a legal activity, and also
– the return on legal expansion and increase of efficiency correlated to the return on tax evasion.

There are also crimes of clearly economic nature where the explicit aim of the activity is illegal profit making (for example fictitious VAT refund claims, fraudulent bankruptcies and embezzlements, cheating on excise taxes). Such activities call for updating the taxation procedures, increasing the efficiency of tax audits and decreasing the motivation as possibly efficient means of influencing.

The shadow economy is inseparable from the tax system and the rate of employment. Two extremely large groups within the income created in the underground economy stem from

– unreported employment and
– the evasion of the tax and the customs system.

The Hungarian tax system has been basically built upon the principles of pay and file since the tax reform of 1988. It is a fiduciary relation that the state holds as a prerequisite for tax-payers willing to comply with the law. In parallel with the economic transition that started a few years ago, there has been and there is a continuous increase in the number of people who breach this fiduciary relation. Its reasons could be that the relationship between collecting and using the taxes has not yet had publicly understood in Hungary, and the tax morale is rather low.

Due to the continuous liberalization of economic law there are a number of possibilities for abuse. There is no legal regulation and legislation of criminal law to serve the disclosure of abusers, as a control for the fiduciary relation. In addition, the legal

[1] The following standards also exist: the general data transmission system of the International Monetary Fund, the recommendations of the International Labour Organization of the United Nations for the measuring of the indicators of employment in the shadow economy (*Fleming–Roman–Farrel* [2000]).

regulations are rather complicated, they change frequently and force tax payers to pay taxes beyond their capabilities. Today, there are companies that have specialized in utilizing the blank spots of the tax system, and they are usually a few steps ahead of the preparation phase of legislation.

There are different estimates by sector and activity for the size of the shadow economy. These, however, do not indicate the approximate amount of damage or gain created in these areas as a result of illegal or unreported activities.[2]

Estimates claim that today the amount of unreported tax and contribution is about one thousand billion HUF.

Phenomena of the shadow economy can be classified by their relationships to the regulatory system of the economy, that is:

– There are means of gaining income where the activity is neither economic in its nature nor legal. These areas are basically known (for example arms trade, illegal security mafia, receiving, drug trade and other illegal activities). These basically fall outside of the competence of economic policy.

– There are activities that are clearly economic crimes committed for the purpose of illegal profit making. These methods of making income are quite significant in Hungary today.

– Finally, there are other means of making income where the underground economic activity is carried out within the frames of legal economic organizations entangled with completely legal economic operations. The content of this underground economic activity is the decrease of tax and contributions paid by the venturer. Today these activities represent the greatest part of the shadow economy.

The significance and actual forms of the underground economy are fundamentally influenced by the financial policy of the state and, within it, tax policy and social policy. The results of the studies about the characteristics of the black economy show that several groups of factors are in close relationship with the development of the shadow economy, such as:

– indirect taxes burdening companies and private individuals,
– tendencies in the changing of tax burdens,
– the extent of state regulation of (intervention into) the economy,
– the level of tax morale.

[2] In order to reveal the sector specific ratios of the private sector and the shadow economy, the GKI Economic Research Co. carried out the updating of the former estimations in 1994. The studies resulted in interesting conclusions about the route of the migration of domestic private- and international properties.

Without any further analysis, these factors clearly explain even few percent differences in the rates of black economies in the developed OECD countries to their GDP.

2. Characteristics of the shadow economy

The signs of the increasing hidden economy in the 1980s and 1990s came to the foreground of the interests of politicians and social scientists. One of the most comprehensive studies on the size of the shadow economy is a *study covering 17 OECD member states* that indicated a significant increase in the volume of the underground economy.

Table 2

Share of the shadow economy in the GNP, currency demand approach
(percent)

Country	1960	1970	1980	1990	1994
Austria	0.4	1.8	3.0	5.1	6.8
Belgium	–	10.4	16.4	19.6	21.4
Canada	–	–	10.1–11.2	13.6	14.6
Denmark	3.8–4.8	5.3–7.4	6.9–10.2	9.0–13.4	17.6
Germany	2.0–2.1	2.7–3.0	10.3–11.2	11.4–12.0	13.1
France	–	3.9	6.9	9.4	14.3
Ireland	–	4.3	8.0	11.7	15.3
Italy	–	10.7	16.7	23.4	25.8
The Netherlands	–	4.8	9.1	12.9	13.6
Norway	1.3–1.7	6.2–6.9	10.2–10.9	14.5–16.0	17.9
Spain	–	–	18.0**	21.0	22.3
Sweden	1.5–1.8	6.8–7.8	11.9–12.4	15.8–16.7	18.3
Switzerland	1.2	4.1	6.5	6.9	6.6
United Kingdom	–	2.0	8.4	10.2	12.4
USA	2.6–4.1	2.6–4.6	3.9–6.1	5.1–8.6	9.4
Japan	2.0*	–	4.1*/**	–	–
Finland	3.1*	–	7.6*/**	–	–

* Value calculated by model estimation.
** Data from 1978.

The most surprising fact revealed by the study was that the penetration, or increase in proportion of the shadow economy has grown faster than any other economic indicators. While in 1960 the size of the shadow economy in the studied OECD countries remained below 5 percent of the GNP, the share of this sector grew above 10 percent of the GNP in 1994.

To understand the reasons for the changes it is essential to examine them in the tax system and the regulations. If the tax system changes, by decreasing the tax burdens for instance, the shadow economy may be suppressed at first, but it can also gain influence later on. Between 1988 and 1990 the underground economy grew in the studied countries in spite of the lower tax rates of the tax reform because other important factors (for example regulations) developed unfavourably, making people work in the shadow economy. The effects of a lower direct tax burden were annihilated by the increasing regulations.

The growth of the hidden economy is also significant in countries where it used to have a much smaller share. In 1970 in the USA the share of the shadow economy was 3.6 percent, by 1990 this indicator reached 9.4 percent and remained around 10 percent at the beginning of the new decade, amounting to approximately USD 1000 billion.

The foregoing study came to the following conclusions about *the most important reasons of the increase*:

– The higher significance of the shadow economy is mainly due to the growing general tax and social security burdens. It may lead to the erosion of the tax and social security funds and finally to the decrease of inland revenues that further increases the budget deficit and the direct and/or indirect tax rates, and that would lead to a further expansion of the shadow economy.

– In case of an increasing shadow economy, decision makers of the economic policy may misinterpret the incomplete "official" indicators (for example official labour, earnings, consumption). In such cases a flowering shadow economy may cause serious problems to politicians.

– We may consider its increase as a reaction of individuals overburdened by the functioning of the state (such as by high taxes and a growing number of regulations).

– The increase may motivate (local and alien) employees to work in the shadow economy and reduce their work in the legal economy.

According to the newest global researches "The average size of the shadow economy (in percent of official GDP) over 2002/2003 in developing countries is 39.1%, in transition countries 40.1%, in OECD countries 16.3%, South Pacific

Islands 33.4% and 4 remaining Communist countries 21.8%." (*Schneider* [2004]). It seems, however, that its share is increasing due to certain differences in the growth of income (*Schneider–Enste* [2002a], *Schneider–Klinglmair* [2004]).

Table 3

Shadow economy as percent of GDP in different periods

Country group	Percent of GDP	
	1988–2000*	2002–2003**
Developing	35–44	39
Transition	21–30	40
OECD	14–16	16

* The ranges reflect the different estimation methods used by different sources (*Schneider–Enste* [2002a]).

** The average size of the shadow economy based on currency demand and DYMIMIC (dynamic multiple-indicator multiple-cause model) approaches (*Schneider* [2004]).

Unreported income is obviously intended to optimize the income of tax payers. The following points are worth considering in this respect:

– The growing probability of detecting tax evasions decreases the extent of unreported incomes. The effect of the amount of the penalty on the ratio of concealing has not been clearly demonstrated.

– A motivation for concealing tax may be a high level of average tax burden. It can be completed by various other studies that, if the average tax burden is too high, it may lead to unreported tax and unreported work. Some surveys show that a 1 percent increase of tax burdens may result in 8 percent growth in unreported income.

– Another motivating factor is a progressive income tax system. It is argued, however, whether the increase of the tax free bracket decreases the amount of unreported income. The decrease of tax burdens and the positive changes in the bracket free margins did not clearly result in the increase of the inland revenue either.

– The researchers have not yet been able to find a close connection between the size of incomes and the frequency rate of their concealment. Families with great income take the risk of concealing of income at the same frequency rate as families with small income. However, it has been understood that the higher the rate of income not properly documented, the higher the extent of unreported income.

– A number of researchers have examined the relationship between the qualification of the tax payer and the extent of tax evasion.[3] All in all we may say that tax evasion is less frequent among people with higher qualification. It also means that a more intensive tax audit can only "deter" better educated people.

– A very useful practice for tax payers to be able to gain insight into the tax records at the local governments. Publicity is a means of social control that decreases the extent of income concealment via inspection by a stranger.

Global data received from international studies very clearly show that the extent of the shadow economy is significant and its existence cannot be neglected. Its size has undergone significant changes and it keeps changing; it is smaller in industrial countries and bigger in developing countries (compared to the characteristic economic indicators like GDP of the particular country) (*Schneider* [2004]).

Table 4

Estimates about the size of the shadow economy by using various methods

Country	Average size of the shadow economy in percent of official GDP using currency demand and DYMIMIC approaches	Average size of the shadow economy in percent of the official rate of employment using questionnaire method
	for the year 1999/2000	
Developing countries in		
Africa	42 *(23)*	48.2 *(23)*
South- and Central America	41 *(18)*	45.1 *(18)*
Asia (except for Hongkong, Japan and Singapore)	29 *(26)*	33.4 *(26)*
Transition economies	35 *(23)*	–
Western OECD countries – Europe	18 *(16)*	16.4 *(7)*
North American and Pacific OECD Countries	13.5 (4)	–

Note. The numbers given in brackets refer to the number of countries.
Source: *Schneider* [2002b].

[3] In this respect it is to be considered whether the "secondary analysis" of tax returns may provide accurate results. Some scholars (for example *E. Sik*) do not even consider it as an estimation method.

In transition countries, there are serious concerns about the size (share) of shadow economies defined by estimation, in addition to methodological problems:

– Different methods result in different estimations. There is no guarantee that the results obtained by different methods would coincide.

– Every method has advantages and disadvantages. In lack of procedures to compare the different methods we cannot select the "best" one (the only meaningful feedback would be a comparison with reality but we do not know the real size of the shadow economies).

– Generated timelines are not suitable for further analysis because of the dynamic change in the environment and the inaccuracy of available data.

The estimation accuracy of the size of regional and global shadow economies reflects the terminological and methodological problems described previously that are frequently discussed in a number of publications. One of the consequences of the inaccuracy of current estimations and the changes in the economic systems of transition countries is the impossibility to provide a ranking (*Dallago* [2002]). It seems obvious that the cause of this problem roots in the followings:

– The elements of the system of shadow economies and their loose internal connections are not entirely understood.

– We do not know much about the relationship between legal- and shadow economies.

– There is no information on the behaviour of major actors in the economy.

– There aren't sufficient quantity and quality of data available.

– There is no method of adequate accuracy − especially to manage a dynamically changing economic environment together with its impacts.

– Even in cases where there is a set terminology estimation, accuracy cannot be increased "endlessly".

There are rather different estimations made in the international practice about the size of the shadow economies in particular countries. These estimations, however, justify the generally accepted belief that the share of the hidden economy is in negative co-relation with the level of development of a country. According to certain estimations the share of the shadow economy in the independent countries formed out of the member states of the Soviet Union reaches 30 percent, in the newly joined

countries it amounts to 15-17 percent, in Southern-European countries it is 10 percent, and in developed industrial countries it is about 5-7 percent (*UN* [2003] p. 14.)

Table 5

Size of the shadow economy in transition countries

Transition country	Size of the shadow economy (in percent of GDP)		Labor force of the shadow economy (in percent of working-age** population) 1998/99
	Physical input (eletricity)* method	DYMIMIC method	
	Average 1990–1993		
	Former Soviet Union		
1. Armenia	39.4	40.1	40.3
2. Azerbaian	43.8	45.1	50.7
3. Belarus	34.0	35.6	40.9
4. Estonia	33.9	34.3	33.4
5. Georgia	43.6	45.1	53.2
6. Kazakhstan	32.2	31.9	33.6
7. Kyrgyzstan	34.1	35.2	29.4
8. Latvia	24.3	25.7	29.6
9. Lithuania	26.0	26.0	20.3
10. Moldavia	29.1	29.3	35.1
11. Russia	27.0	27.8	40.9
12. Ukraine	38.4	29.4	41.2
13. Uzbekistan	20.3	22.1	33.2
Unweighted average	*32.8*	*32.9*	*37.1*
	Central and Eastern Europe		
1. Bulgaria	26.3	27.1	30.4
2. Croatia	23.5	24.6	27.4
3. Czech Republic	13.4	13.1	12.6
4. Hungary	**20.7**	**22.3**	**20.9**
5. Macedonia	34.5	35.6	35.1
6. Poland	20.3	22.3	20.9
7. Romania	26.0	27.3	24.3
8. Slovakia	14.2	15.1	16.3
9. Slovenia	22.4	22.9	21.6
Unweighted average	*22.4*	*23.4*	*23.3*

* Using values from *Johnson–Kaufmann–Shleifer* [1997].
** Working age is between 16 and 65.
Note. The DYMIMIC method is one of the most developed techniques applied in practice today.
Source: *Schneider* [2002b].

A widespread method of comparing statistics is based on the collating of input and output that involves the contrasting of production with consumption on a certain level of disaggregation (commodity-flow method). The approach in which the ratio of current consumption and gross output is compared with a value characteristic of a particular sector can be considered as a professional estimation (comparison with norm). In this case the corrections of GDP calculation have to be performed on the basis of larger divergences. The direct surveys recommended by the methodology should not primarily be applied to income from underground economic activities but to the consumption of products and services deriving from such activities. This way, we have more accurate information since the activity itself is illegal but the consumption of its output is usually legal. Such surveys are frequently applied to construction and renovation works.

Other significant discrepancy methods include the comparison of the amounts of VAT calculated on the basis of national accounts and actually collected by the tax authority, or the comparison of the theoretical value of income tax also calculated on the basis of macro-aggregates with the amount of income tax actually collected.

The conclusions about the size of the shadow economy drawn from macroeconomic data and calculated by macro-models were mainly typical in the 1990s (*Giles* [1999], *Frey–Schneider* [2001], *Bernotaite–Piskunova* [2005]). These methods were widely criticised. The major critics claimed that these methods mixed up elements that are not observed with others or that are observed but inaccurately measured; the models are based on simplifying presuppositions and aren't robust enough; and the results obtained by different methods significantly differ from each other. One of the most typical methods of calculation based on macro data tries to estimate the size of the shadow economy on the basis of financial aggregates. It is presupposed that, by their nature, underground economic activities primarily demand cash and they try to draw conclusions from the number of transactions, the cash/deposit ratio, and the amount of cash in circulation. The speed of circulation in transactions was usually measured by the wearing out of bank notes calculated between the dates of issue and withdrawal. It obviously often led to distorted results since, for instance, it disregarded the international circulation of money. In two other cases the presupposition was that the cash/deposit ratio and the amount of cash are influenced exclusively by changes in the tax system and the regulations and thus they made estimations by filtering these out. The two experiments showed significant differences, the results were significantly distorted by various forms of cash payment and savings.

In another basic methodology based on macro-data, calculations are made on the basis of a global indicator. Such an indicator may be the consumption of electricity. It may also lead to distorted results since, for instance, the volume of consumption in agriculture is strongly dependent on the weather, a fixed part of consumption is not

proportional to the economic activity and − due to artificially low prices − the consumption does not decrease together with the activities of production. Regression models formerly used in practice are also worth mentioning among macro data-based methodologies; they were most often criticized for their arbitrarily selected explanatory variables and their hardly explainable causal relationships.

In the past ten years bottom-up methodologies, also recommended by Eurostat, came to the foreground. The most typical estimation methods include the labour input method mentioned previously, and indirect surveys as well as expert estimations. There are obviously other methods mentioned in the literature. An estimation about the size of Slovenia's shadow economy was made by applying and comparing three indirect methods: the consumption of electricity, the currency demand and the labour input methods (*Nastav–Bojnec* [2005]). A British model was adapted to Latvia in which food consumption as a macro-indicator served as a basis (*Bernotaite–Piskunova* [2005]). It is obviously arguable whether higher income results in proportionately higher food consumption. In another case the total of labour expenditures performed in the shadow economy was calculated on the basis of Romanian household statistics, and then proportioned to the GDP (*Albu* [2003]). The same method was also applied to calculations about certain major sectors (*Ivan-Ungureanu* [2001]). The shadow economy of Slovakia was basically calculated by the current Eurostat methodology primarily based on the analysis of the discrepancies between VAT figures collected actually and defined theoretically on the basis of Labour Input and the national accounts (*Balaz* [2004]). The Polish shadow economy was measured by the labour input method: the results of a small company were compared with the labour force survey based on household questioning, and expert estimations were also applied (*Jakóbiak* [2000]). In Bulgaria quarterly and annual surveys were made based on direct collection of partially qualitative information in which the data providers made estimations about the site of the shadow economy, the ratio of unreported activities, and the volume of VAT and other tax evasion (*Vitosha Research* [2003]). Other researchers used the labour input model (*Calzaroni* [2000]) together with other elements of the Eurostat methodology and made estimations on the basis of the panel model about the size of the shadow economy in OECD countries derived from the level of taxation and a corruption index (*Bosi* [2002]). They also estimated the underground labour supply on the basis of a simplified cost-benefit analysis and concluded that the general level of taxation fundamentally influences the size of the shadow economy in developed economies, therefore its share is the greatest in the Scandinavian countries (*Frey–Schneider* [2001]). The correlations between the shadow economy and the effects of tax burden were examined by a model of econometrics (*Giles–Caragata* [1999]) but the efficiency of this method is also weakened by its reliance upon former estimations about the size of the underground economy (*Bosi* [2002]). The correla-

tions of taxation, unemployment and the ratio of the shadow economy were analyzed on the basis of Russian and Ukrainian data by a macro-model (*Bilonizhko* [2006]).

Out of the estimation methods mentioned in the Eurostat methodology, some experts primarily prefer direct methods. Considering the factors specifically resulting in the expansion of the shadow economy in newly joined, former socialist countries these experts set up the following major categories:

> *1*. Elements in the first group are referred to as social-economic/market factors: an example is the phenomenon in which the fast structural changes during the transition to market economy led to distortions in the labour market and, as a result, various forms of unreported employment appeared. The transition and the quick pace of privatization resulted in the sudden increase of unemployment figures and the increase of unreported employment. Foreign capital investments, however, contributed to the increase of legal employment since these investors tried to avoid illegal forms of employment. It has become generally accepted that the sectors most infected by underground activities are the ones dominated by domestic capital.
>
> *2*. The second group includes institutional factors, primarily high levels of tax and contribution burden. Unreported employment is also stimulated by the underdevelopment of the institutional infrastructure, that is, the quick changes or lack of transparency in the regulations, the underdevelopment of the financial sector, the lack of efficiency in the tax audit system, etc. Legal operations are also hindered by too bureaucratic and expensive mandatory procedures, like in the case of establishing a company, or the possible interventions into the private sector by the state.
>
> *3*. The third group includes factors deriving from social traditions and attitudes. These causes are the most difficult to change and they will probably have long-term effects. These factors include the attitude of hostility against the state, and generally against all authorities or systems of norms and rules, as well as the lack of public trust. It entails that the tax payers do not believe that their payments are used properly. Evading contributions is dominated by a short-sighted perspective: contribution payers believe that their future pension will not depend on their current payments.

Apart from these, all means of collecting income are legal in market economies and the law can usually prevent or eliminate them with low efficiency. There were

types of underground activities exclusively characteristic of socialist countries: unreported employment, wages applied as costs, illegal second job next to the legal one, employing unjustified beneficiaries of supplies, illegal employment of foreign citizens, unauthorized economic activity, unreported personal services, such as teaching, baby-sitting or cleaning, etc. (*Renoy et al.* [2004]).

In Hungarian studies the ratio of the shadow economy was calculated on the basis of electricity consumption. Researchers estimated the energy consumption indicating personal use or production on the basis of a cross-section statistic model (*Lackó* [1996]). The disadvantage of the method is that it may provide unreal results, like in the case of Slovenia (*Nastav–Bojnec* [2005]). The developed model, however, is applicable in controlling the results of a bottom-up method. The motivations of participating in the shadow economy and the possible measures of suppressing it (*Szántó–Tóth* [2001]) as well as the temporal changes in the contract and tax morale of companies have all been examined by a direct survey (*Semjén–Tóth* [2004]). The researchers studied the answers looking for factors influencing the contract and tax morale by a model inscribed on nominal variables.

Experts are regularly examining in detail the general and system specific reasons of the shadow economy (*Ékes* [2003]). Hungarian researchers find similar reasons to the ones ascertained by international colleagues. Among the general causes they mention excessive taxation, operational problems of the institutional system, overregulation, poverty, higher levels of income only available by underground means, inflation, the growth of the service sector, the reduction of working hours, and the traditions. System specific reasons most typical in transition economies are the mixing of a wage system inherited from the socialist era with market-based forms of distribution, privatization, and the dismantling of the former state property, as well as the deficiency of economic and legal regulations, for example loopholes. The most characteristic phenomena of the shadow economy in Hungary have been analyzed in details in recent years. These include tax evasion, transfer type incomes (that is the transferring of income within private individuals), illegal labour together with their social and economic impacts. The estimated size of the shadow economy is also considered in international comparison.

The volume of underground activities is usually estimated in practice by direct or indirect methods.[4] The Eurostat methodology referred to previously primarily recommends discrepancy-analyses, since they are based on available statistics, and thus statisticians can be provided with easily and repeatedly calculable procedures. Even though it approaches *direct surveys* with reservation, since data providers obviously

[4] Direct methods include questionnaire studies, the application of the results of administrative audits, and experience-based expert estimations. Indirect methods cover estimations based on the discrepancies in the official statistical observations, and they apply top-down methodology on the basis of financial or natural macrodata.

cannot provide accurate information, this methodology accepts the necessity of such limited information in the estimation of the shadow economy.

In spite of the former doubts, one of the significant trends of the recent years was the increasing role of the so called public opinion surveys performed by personal interrogation. Several of them have been published recently about the Hungarian shadow economy; they are primarily based on the results of questionnaire studies carried out among companies and individuals within the frames of ECOSTAT.

These public surveys summarize the results obtained from personal *questioning in active households*, as well as the answers collected from companies by questionnaires. The questions covered the views and opinion shared in the surveyed households about the shadow economy and their participation in it (*Belyó* [2002], [2007]). Results showed that the government measures intended to serve the fiscal budget balance have a direct influence on the unreported income of the individuals, as well as on the evasion of tax and other payments (for example social security). The values shared by the individuals in the sample prove that the compliance with economic laws and regulations is considered essential; the majority of the individuals in the sample do not intend to break the law, 49 percent claim that they would never do anything like that. Another significant group (13%), however, claims that incompliance with the law derives from deficiencies of the current legal regulations, especially tax regulations; and 7 percent of them believe that incompliance with the law is necessary in lack of other alternatives.

The survey carried out *among Hungarian companies* offered insights into their relationships with the underground economy.

70 percent of the chief executive officers are convinced that there are means to fight against the shadow economy and to suppress its possible appeal or necessity (*Belyó* [2002], [2007]).

The results of direct surveys are necessarily reconcilable with other methods of observing the shadow economy. In parallel with the international practice, Hungarian studies consider the labour input method as essentially important. It is basically a comparison of the volumes of labour expenditure collected from company surveys and household questionings. The latter is typically a higher value serving as the basis for the estimation about the size of the shadow economy. Direct surveys should also be carried out about the labour expenditures connected to underground activities. Experience shows that data providers are willing to render detailed information about labour done in the shadow economy if it is not an illegal activity. Useful information may also be obtained from questions concerning time consumption. In this case data providers describe the overall consumption of their time that often provides more accurate information on labour expenditures than household labour surveys. Useful information for grounding expert estimations is provided by surveys based on qualitative questions.

Obviously, there is no one "best" methodology, the foregoing methods are used in practice as complementary solutions depending on available data and information. The different methods will surely provide different estimations and that raises the question of which one to accept. The upcoming chapter offers an overview of the Hungarian and international results of the former estimations.

3. Measuring the size of the shadow economy

We do not have direct and exact information about the extent and change of the shadow economy – as the expression itself suggests. However, its main characteristics have been identified by the researches of the last few decades, which also provide possibilities to make approximate calculations, linked sample survey, opinion polls, and quite solid professional estimates.

Studying the extent and certain fields of the shadow economy, it could be especially important to have an extensive knowledge about it in international organizations and possible interpretation in the aspect of Hungary. Researchers have quested for samples that could express in numbers some segments of the hidden economy for several decades.

Direct and indirect approach, and recently model-based approximation are applied for estimating the rate of the hidden economy. Direct approaches can be sampling surveys or estimates deriving from for example tax audits. Statistics based on national accounts (income-expense) or labour market are used in indirect approach, but the so called transaction and currency demand approach, or for example the material input based methods (power consumption) are also applied. During model-based approximation, latent variables are used in dynamic structural equations, or multiple indicator models, multipurpose models, and in dynamic multiple indicator or multipurpose models.

The Statistical Office of the European Communities feels it necessary to create a standard terminology that constitutes a common conceptional frame and makes it possible to develop the valuation methods of the hidden economy. It has become absolutely clear how substantial it is to review the possibilities of estimation for illegal production activities. In the case of economies in transition, it could be a crucial objective to integrate and institutionalise the informal sector, but in the developed countries new statistical methods that can be adapted for measuring brand-new, emerging forms of informal activities must be developed.

There has been a great leap forward to form a general model for surveying hidden economy, but the different approaches and separated data sources seem to remain a

constant problem. In the matter of further projects it is necessary to provide comparability, especially in the context of international data and transparency. All these activities presume new methods to define the extension of the hidden economy. Simulation can be a sufficient methodological choice, because it is able to manage complex, dynamic systems, and it is insensitive for data quality.

The scholars of the field (*Schneider* [1992]) have developed a number of applicable methods since the 1970s to find out about the shadow economy and to measure its size and share. The compiled rough classification of the methods used after 2000 and applicable for measuring would be the following:

– Direct approach
  Sampling survey
  Tax audit
– Indirect approach
  National account statistics (receipts and expenditures)
  Labor statistics
  Transactional approach
  Currency demand approach
  Physical input method
– Model-based approach
  Using latent variables
    – Structural equation modeling (SEM)
    – Multiple indicator multiple cause model (MIMIC)
    – Dynamic multiple-indicator multiple-cause model (DYMIMIC)
  Simulation model

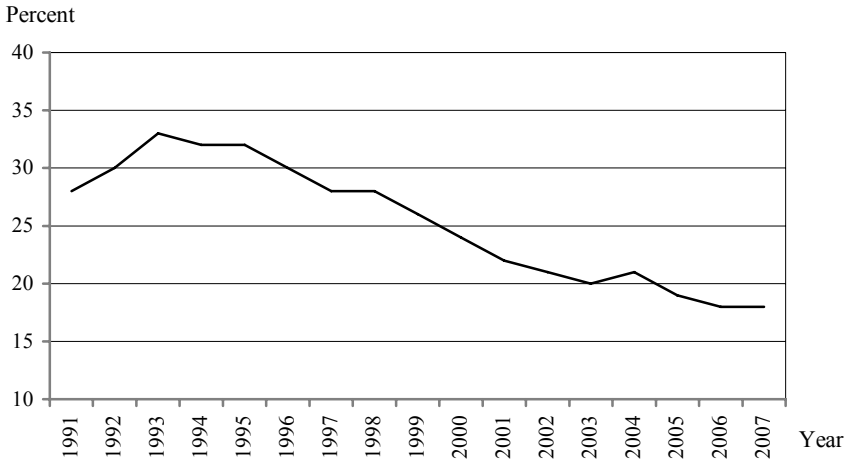
The background for the shadow economy of Hungary from the 1990s is also provided by economic, political and cultural factors. The dynamics and size of the underground economy are the necessary results of them.

The size of the Hungarian shadow economy compared to the official GDP decreased from its 1993 peak of 33 percent to 25 percent by 1998, and it has kept on decreasing since then, according to several surveys (*Lackó* [2000], *Tóth–Sík* [2002]). One of the newest simple experience estimations calculates the possible change in the ratio of the hidden economy on the basis of major changes in macro-level trends and estimates that the rate of the shadow economy is between 18 and 20 percent (*Belyó–Molnár* [2007]). This is also supported by international comparative studies.

In the past two decades the underground economy has undergone a significant change and, as an important characteristic, the income deriving from it fundamentally changed during the period of transition. The structural changes taking place in

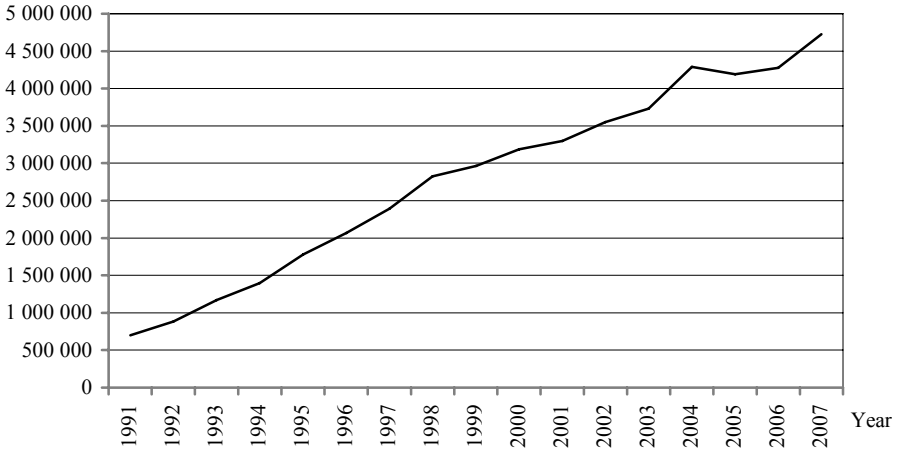
this context are closely related to the changes in the political and economic environment, such as the growing number and economic performance of private ventures, the new income tax, accounting and auditing systems, etc. There have always been new possibilities for the expansion of the shadow economy in areas that were functionally unaffected by the black economy during the planned economy in Hungary.

Figure 1. Size of the shadow economy in percent of GDP



Source: *Belyó* [2007].

Figure 2. Estimated value of unofficial economic activities at current prices
(HUF million)



Source: *Belyó* [2007].

The majority of the shadow economy in the 1980s was provided by unofficial economic activities of private individuals (for example tip, gratitude money, neighbour help, etc.) From the 1990s tax evasion and unreported business activities of companies play the most crucial role in the underground economy. These tendencies, however, have been/are hardly represented in the official statistics. Even if Hungarian statistics have relatively improved in this respect since the end of the 1990s, – moreover, they cover a greater part of the shadow economy than the statistics before the transition to market economy – as a result of the significant increase that took place after the change of the system, a significant volume of production in the underground economy is probably still unregistered. The size of the shadow economy has significantly increased – estimations of international comparisons claim that the volume of HUF 83 billion measured in 1980 increased to HUF 230 billion by 1989, and to HUF 650 billion by 1992 – the improved methods of measurement could only decrease its rate unobserved in the GDP.

The questionnaire studies carried out within the frames of ECOSTAT in the first half of 2000 among companies and private individuals were important milestones in the research of the shadow economy and, in particular, the so called calculation by direct estimation methods.[5]

The urgent need to incorporate the shadow economy into the legal economy is an unavoidable problem and task of our times. There have been a number of measures introduced recently to solve this issue; international experiences highlight the importance of the strengthening of the organization of the tax and contribution collection system, a significant aggravation of sanctions and the increase in the efficiency of the fight against corruption. According to general opinion, the decreasing of the shadow economy results in significant growth in inland revenue, it leads to the production of public goods and services in greater quantity and quality, that eventually stimulates economic growth. We may also claim that in countries where the tax burden is above the optimal level and the co-operation of law enforcement authorities is insufficient, the growth of the shadow economy results in the decline in the growth rate of the economy (*Schneider* [1998]).

The neo-classic approach considers the operation of the underground economy as an optimal reaction to the production and service demands of the economic environment, for example that it is basically dependent upon the states efforts to create a strong, motivating environment, that results in competition, high efficiency and strong limitations in the activities of the government. Experts claim that we should not universally prevent all underground economic activities (*Fleming–Roman–Farrel* [2000]). Empirical studies also show that two thirds of the income

[5] Support for the research was provided by OTKA (Hungarian Scientific Research Fund) T026023 and OTKA T032637.

produced in the shadow economy are practically spent immediately in the legal sector, thus indirectly contributing to the economic growth and the indirect inland revenue (*Schneider* [1998]). In developing countries with high unemployment rate unofficial activities are necessary means of survival for the people and they may never entirely disappear; the enforcement of regulations may only lead to the annihilation of the bases of incomes (*Belyó* [1999]).

Governments are capable of influencing the shadow economy by inspiring certain activities and exploiting the possibilities offered by the economic factors (*Schneider* [1998]). Incentives, prevention, detection, penalizing, and publicity, all of them are instruments to be applied only in a refined and balanced formula (*Grabiner* [2000]).

The practice of economic policy applied against the shadow economy can best be connected to the terminology of untaxed economy (*Atkinson* [1999]). This name reflects on the relationship between income and taxation and shows that the untaxed economy does not only cover tax evasion practices within legal activities but illegal activities as well. The types of income in this category have one thing in common: they are not taxed regardless of the differences between legal and illegal activities.

According to Eurostat calculations, the size of unobserved economic activities was about 12 percent of the GDP in Hungary in 2000. (In Poland and Slovakia this figure shows 15-15 percent, while in the Czech Republic it is only 7 percent.)

Hungarian scholars claim that the size of the shadow economy was the greatest in 1993 compared to the GDP (33%), it has been gradually decreasing since then, and in 2006 a ratio of 17-19 was estimated.

The volume of GDP in 2007 amounted to nearly HUF 25 thousand billion. The structure of the shadow economy shows the following important characteristics:

54 percent of the companies in the productive sectors, and 64 percent of the companies in the service sector claimed that the shadow economy is present in their immediate economic environment.

Most frequent forms of the shadow economy are unreported employment (30%), unreported services (20%), and abuses in waging (17%).

The Hungarian Central Statistical Office carried out its first calculations in 2006 that measured the production of GDP on a wider basis than before in accord with the norms of the EU. The calculations included prostitution, as well as the production and trading of drug increasing the level of GDP by approximately 1 percent.[6]

It is inevitable that the level of tax evasion in Hungary jeopardizes the balanced future growth of the economy. In 2006, the centralization of taxes and contributions

[6] The values are derived from the number of consumer transactions multiplied by the average price. The calculations about the production and trade of drugs are based upon criminal statistics and the sources of the police and the tax authority. The statistics on prostitution are built on data provided by the lobby organizations. However, it does not have any significance from the perspective of inland revenues, these activities do not contribute to the value of taxed income.

amounted to approximately 40 percent of the GDP in Hungary. The aggregate tax and contribution revenues amounted to HUF 8700 billion. On the basis of the estimated value of the rate of the shadow economy compared to the GDP, it probably means more than HUF 1000 billion in unpaid taxes and contributions. It is a gigantic amount, especially compared to the budget deficit of HUF 1.375 billion in 2007.

References

ALBU, L. [2003]: *Estimating the Size of the Underground Economy in Romania.* Institute for Economic Forecasting. Working Paper.

ATKINSON, M. [1999]: *Transfer Pricing – Protecting the Tax Base*. Conference on Quantifying and Controlling the Untaxed Economy. Deloitte and Touche. London.

BALAZ, P. [2004]: *Estimates of Non-Observed Economy in the Slovak Republic*. Statistical Office of the Slovak Republic. Working Paper.

BELYÓ, P. [1999]: *Kísérletek a rejtett gazdaság nagyságának meghatározására.* Módszertani füzetek. ECOSTAT. Budapest.

BELYÓ, P. [2002]: *A lakosság részvétele a rejtett gazdaságban*. Időszaki Közlemények. No. XVIII. ECOSTAT. Budapest.

BELYÓ, P. [2007]: *A rejtett gazdaság a lakosság és a vállalkozások körében.* Időszaki Közlemények No. XXVI. ECOSTAT. Budapest.

BELYÓ, P. – MOLNÁR, I. [2007]: Shadow Economy: The Hungarian Case. In: *Dr. Kirpalani, V. H. – Dr. Garbarski, L. – Kaynak, E.* (eds.): *Successfully Doing Business/Marketing in Eastern Europe*. Routledge Studies in International Business and the World Economy. Routledge. London.

BERNOTAITE, R. – PISKUNOVA, A. [2005]: *An Expenditure-based Estimate of Latvia's Shadow Economy*. Stockholm School of Economics in Riga. Working Paper.

BILONIZHKO, O. [2006]: *Measurement and Determinants of the Hidden Economy in Regions of Ukraine and Russia: Mimic Approach. Master of Art in Economics Thesis.* National University of Kyiv-Mohyla Academy. Kiev.

BOSI, M. [2002]: *The Nature of the Underground Economy. Some Evidence from OECD Countries.* Instituto di Studi e Analisi Economica. Working Paper.

CALZARONI, M. [2000]: A nemzeti számlarendszer teljes körű becslései: új fogalmak és módszertani megközelítés. *Statisztikai Szemle*. Vol. 78. No. 6. pp. 413–434.

DALLAGO, B. [2002]: *The Irregular Economy in Systemic Transformation and Statistical Measurement.* Research Paper Series. Russian-European Centre for Economic Policy. Moscow.

ÉKES, I. [1999]: *A rejtett és informális gazdaság foglalkoztatási hatásai*. Gazdasági Minisztérium. Budapest.

ÉKES, I. [2003]: *A gazdaság árnyéka, avagy a rejtett gazdaság*. Rejtjel Kiadó Kft. Budapest.

FEIGE, E. L. (ED.) [1989]: *The Underground Economies. Tax Evasion and Information Distortion.* Cambridge University. Cambridge, New York, Melbourne.

FLEMING, M. – ROMAN, J. – FARREL, G. [2000]: The Shadow Economy. *Journal of International Affairs.* Vol. 53. No. 2. pp. 64–89.

FREY, B. – SCHNEIDER, S. F. [2001]: Informal and Underground Economy. In: *International Encyclopedia of Social and Behavioral Science. Bd. 12 Economics.* Elsevier Science Publishing Company. Amsterdam.

GILES, D. E. A. [1999]: Measuring the Hidden Economy: Implications for Econometric Modelling. *The Economic Journal.* Vol. 109. No. 456. pp. 370–380.

GILES, D. E. A. – CARAGATA, P. J. [1999]: *The Learning Path of Hidden Economy: The Tax Burden and Tax Evasion in New Zealand*. http://web.uvic.ca/econ/wp9904.pdf

GRABINER, A. [2000]: *The Informal Economy. A Report by Lord Grabiner QC.* The Public Enquiry Unit. HM Treasury. The Stationery Office Limited. London. http://62.164.176.164/d/74.pdf

IVAN-UNGUREANU, C. [2001]: *Non Observed Economy in Romania.* http://www.oecd.org/dataoecd/39/34/2069777.pdf

JAKÓBIAK, B. [2000]: *The Systematic Approaches to Measuring Hidden Economy in Poland*. Central Statistical Office of Poland. Workshop on Measurement of the Non-Observed Economy. http://www.oecd.org/dataoecd/39/35/2069764.pdf

JOHNSON, S. – KAUFMANN, D. – SHLEIFER, A. [1997]: The Unofficial Economy in Transition. *Brookings Papers on Economy Activity.* Vol. 28. No. 2. pp. 159–240.

LACKÓ, M. [1996]: *Hidden Economy in East-European Countries in International Comparison.* International Institute for Applied Systems Analysis (IIASA). Laxenburg.

LACKÓ, M. [2000]: Hidden Economy – An Unknown Quantity: Comparative Analysis of Hidden Economics in Transition Countries 1989-95. *Economics of Transition.* Vol. 8. No. 1. pp. 117–149.

LIPPERT, O. – WALKER, M. (EDS.) [1997]: *The Underground Economy: Global Evidences of Its Size and Impact.* The Frazer Institute. Vancouver.

NASTAV, B. – BOJNEC, S. [2005]: *Shadow Economy in Slovenia.* Managing the Process of Globalization in New and Upcoming EU Members. 6th International Conference of the Faculty of Management Bernardin. http://www.fm-kp.si/zalozba/ISBN/961-6573-03-9/nastav.pdf

RENOY, P. ET AL. [2004]: *Underground Work in an Enlarged Union – An Analysis of Undeclared Work: An In-Depth Study of Specific Items.* European Commission: Employment and European Social Fund. Brussels. http://www.csd.bg/en/econ/fileSrc.php?id=1488

SCHNEIDER, F. [1992]: *The Development of the Shadow Economy under Changing Economic Conditions: Some Tentative Empirical Results for Austria.* Conference on Mass Migration in Europe. Vienna. Working Paper.

SCHNEIDER, F. [1998]: *Stellt das Anwachsen der Schwarzarbeit eine wirtschaftspolitische Herausforderung dar?* Einige Gedanken aus volkswirtschaftlicher Sicht. Mitteilungen des Instituts für angewandte Wirtschaftsforschung (IAW). Linz.

SCHNEIDER, F. [2002a]: *The Size and Development of the Shadow Economies of 22 Transition and 21 OECD Countries.* Discussion Paper Series. Institute for Study of Labo. IZA DP No. 514. Bonn.

SCHNEIDER, F. [2002b]: *Size and Measurement of the Informal Economy in 110 Countries Around the World.* Workshop of Australian National Tax Centre. ANU. Canberra.

SCHNEIDER, F. [2004]: *The Size of Shadow Economies of 145 Countries All Over the World: First Results Over the Period 1999 to 2003.* Discussion Paper Series. Institute for Study of Labor. IZA DP No. 1432. Bonn.

SCHNEIDER, F. – ENSTE, D. [2002a]: *Hiding in the Shadows: The Growth of the Underground Economy.* IMF. http://www.imf.org/external/pubs/ft/issues/issues30/index.htm

SCHNEIDER, F. – ENSTE, D. [2002b]: *The Shadow Economy: Theoretical Approaches, Empirical Studies, and Political Implications.* Cambridge University Press. Cambridge.

SCHNEIDER, F. – KLINGLMAIR, R. [2004]: *Shadow Economies Around the World: What Do We Know?* Discussion Paper Series. Institute for Study of Labor. IZA DP No. 1043. Bonn.

SEMJÉN, A. – TÓTH, I. J. [2004]: Rejtett gazdaság és az adózási magatartás, 1996–2001. *Közgazdasági Szemle*. Vol. LI. No. 6. pp. 560–583.

SMITH, P. [1994]: *Assessing the Size of the Underground Economy: The Statistics Canada Perspectives.* Canadian Economic Observer. Catalogue No. 13-604-MIB No. 28. Canada's National Statistical Agency. Ottawa.

SZÁNTÓ, Z. – TÓTH, I. J. [2001]: A rejtett gazdaság és az ellen való fellépés tényezői. *Közgazdasági Szemle.* Vol. XLVIII. No. 3. pp. 203–218.

TÓTH, J. – SIK, E. [2002]: Hidden Economy in Hungary 1992–1999. In: *Neef, R. – Stanculescu, M.* (eds.): *Social Impact of Informal Economies in Eastern Europe*. Ashgate Publishing. Aldershot. pp. 219–230.

UN [2003]: *Non-Observed Economy in National Accounts – Survey of National Practices*. United Nations Economic Commission for Europe. Geneva.

UNO [2007]: *Towards 1993 SNA Rev.1*. http://unstats.un.org/unsd/nationalaccount/snarev1.asp

VITOSHA RESEARCH [2003]: *The Hidden Economy in Bulgaria.* (General Population.) Working Paper. http://www.vitosha-research.com/fileSrc.php?id=1145

Grey Areas of LFS Employment Calculation

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The Hungarian employment rate is one of the lowest among EU member states. A special grant offered by the EU provided a possibility for a deeper analysis of the problem fields, which could be caused by the most important non-survey-type differences. For Hungary it is extremely important to study the employment situation in agriculture because one third of the households perform some agricultural activity, but only 5 percent of the employed population work in the agricultural sector. A special study tried to find an answer to the question whether this second figure is true or false. The other investigated field was the real extent of student work.

KEYWORDS:
Labour force management.
Labour statistics.

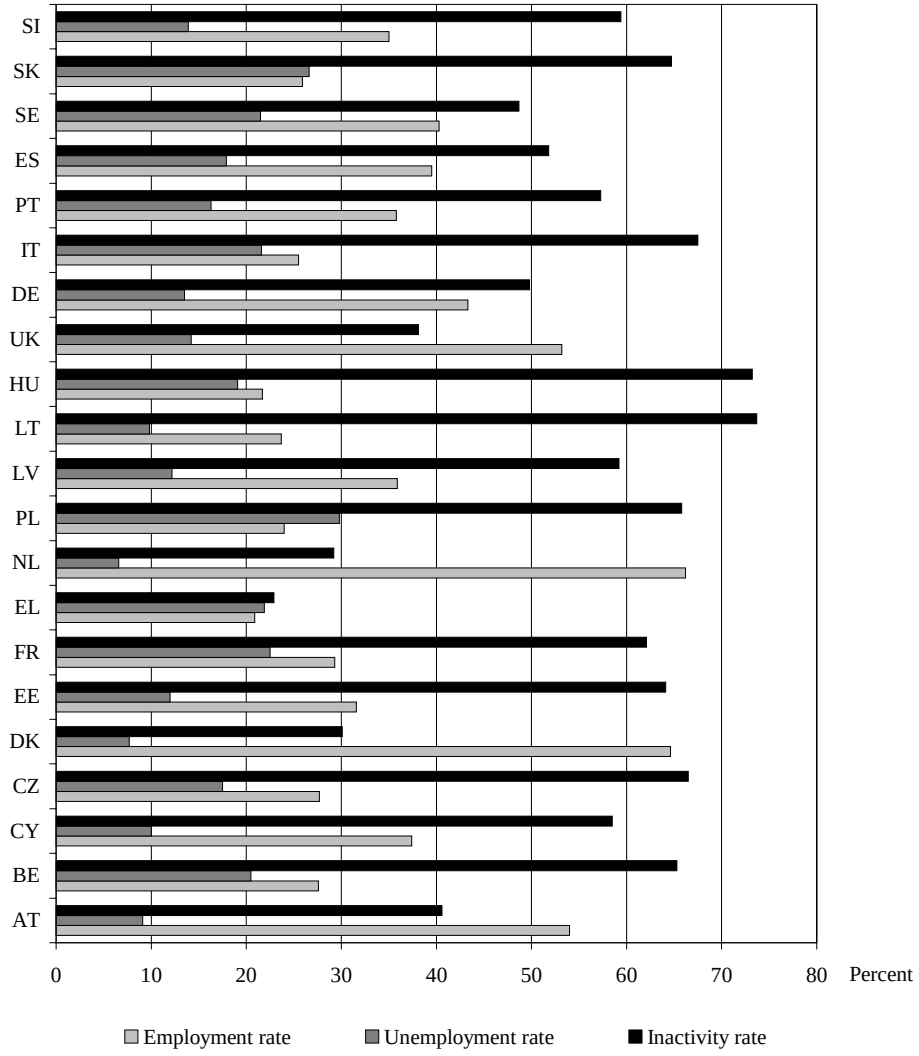
It is well known that Hungary is considered to be a rearguard regarding the level of the employed population aged 15–64 among EU member states. The reasons are known: the slowly and gradually increasing, traditionally low retirement age limit accompanied by the unfavourable health condition of the population is causing the low activity rate of people aged over 50; at the other end of the age scale, the population under 18 is retained in the schooling system indebted to the Act of Public Education, and nowadays the secondary school leavers continue their studies on day-time courses of tertiary education in greater shares than any other preceding generation; the labour market exclusion of the population of Roma and non-Roma people with low educational attainment developed in the 1990s was not only preserved but the phenomenon of inherited unemployment was appeared as well, that is to say, the young unemployed adult population looks on subsistence on benefits as a natural status.

The current study does not focus on these basic characteristics but on the fields, where the Labour Force Survey (LFS) – considered to be the main source of labour market data internationally – does not produce a true picture due to its methodology. Two main areas were studied in detail: the first was the work of full-time students and the second was the measuring problems of the agricultural activity of the non-employed. It was possible on the basis of LFS ad-hoc modules that have been covering these subjects in the recent years. An EU grant application on the grey zones of the labour market was announced for which Hungary applied with the previously mentioned topics. The current study is based on the summary report of this grant.

1. Student work – employed in full-time education

Capturing the labour market activity of students studying on day-time courses stands to be a weak point in employment measuring. The Hungarian Labour Force Survey (HLFS) indicates a low employment rate in international comparison for young people including full-time students. (See Figure 1.)

Figure 1. Labour market indicators of youth (aged 15–24) in some EU member states, 2006



Source: CLFS (Community Labour Force Survey).

This rate broadly reflects the situation well, because combining study and employment has not got long traditions in Hungary, but the employment rate of students may be higher than it is indicated by LFS. This notion is based on the following reasons:

– In Hungary proxy answers are also allowed during data collection in LFS like in most other countries carrying out the same survey. It means that questions regarding the economic activity of students can be answered by any adult member of the household. The rate of proxy interviews is outstandingly high among students residing and studying in other settlements. They are not present at the time of data collection but belong to the household according to the LFS methodology as a part of its income and consumption unit, so their data have to be recorded. (A sampling unit of the Hungarian LFS is a dwelling. Theoretically, a group of students renting a dwelling can be also selected in the sample but it has little chance and the positive response is not likely.) It is quite common in household surveys that personal questions are answered by a household member living in the dwelling. It is rarely a student.

Table 1

Types of interviews of the supplementary survey "Youth on the Labour Market"
(percent)

Age-group and sex	Supplementary survey questions answered by			No answer	*Youth, total*
	the respondent	another family member	together		
15–19					
Male	26.3	71.0	97.3	2.7	*100.0*
Female	29.5	67.1	96.6	3.4	*100.0*
Both sexes	*27.9*	*69.1*	*96.9*	*3.1*	*100.0*
20–24					
Male	28.8	67.2	96.1	3.9	*100.0*
Female	44.0	52.8	96.8	3.2	*100.0*
Both sexes	*36.4*	*60.0*	*96.4*	*3.6*	*100.0*
15–24					
Male	27.6	69.1	96.7	3.3	*100.0*
Female	37.0	59.7	96.7	3.3	*100.0*
Both sexes	*32.3*	*64.4*	*96.7*	*3.3*	*100.0*
25–29					
Male	36.5	55.3	91.7	8.3	*100.0*
Female	57.1	34.1	91.2	8.8	*100.0*
Both sexes	*46.6*	*44.8*	*91.5*	*8.5*	*100.0*

Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

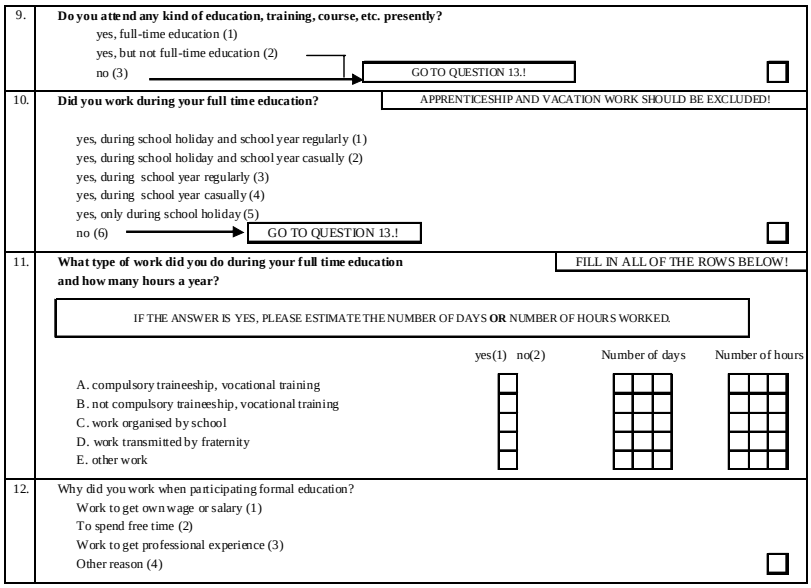
– If the student is present during data collection and answers the question him/herself, it will not be sure whether he/she interprets the question regarding the one-hour income earning activity as an activity besides his/her student status.

– The "Number of employed persons" from LFS can be interpreted as an average value. The "Number of persons engaged in casual work" (typical for working pensioners and students) can be higher than it is indicated by LFS according to its otherwise correct methodology. Other available data sources such as the number of placements provide information on the number of persons involved in this activity. However, this data is not suitable to validate LFS based information.

The labour market position and employment characteristics of young people are considered to be a key priority in the Hungarian labour statistics. From the commencement of LFS, a youth ad hoc module is connected to the core survey by two-three years. In the module of the fourth quarter 2006 a separate block was dedicated to this topic to clear the issue of employment of students besides studying. (See Table 1.)

The target population was students aged 15–29 studying on day-time courses during the week of data collection. Figure 2 shows the corresponding question block.

Figure 2. Some questions of the youth ad hoc module questionnaire, Quarter 4, 2006



7.4 thousand young people of 846 thousand full-time students were qualified as employed according to the core questionnaire of the fourth quarter 2006. (More precisely, 7.4 thousand people considered to be employed reported themselves as studying on day-time courses during four consecutive weeks before the time of data collection.) This value equals to 8.7 thousand on an annual average in 2006 (the lowest value was measured in the fourth quarter and the highest was quantified in the third quarter). Low values are expounded by the small number of observations. The different seasonal tendency of different years is explained by this as well.

Eighty percent of students considered to be employed based on the core survey are studying in tertiary education. The mean of actually worked hours per week based on the core questionnaire equals to 26.7, which is fairly high. This value was 32.3 hours for students in Ph.D. programmes and 30.5 hours for participants of post-secondary vocational training courses. The dispersion of data of hours refers to data collection errors. The unreal data of hours, as well as the incoherence of the age-related education level and information on hours verify the measurement error at 15 percent of the respondents. Additional controls are justified.

The previously mentioned fact shows low soundness in measuring the employment rate of full-time students. The youth ad-hoc module was based on reverse logic: it focused on students studying on day-time courses and asked whether the respondent had worked besides his/her classes in the previous year. (See Table 2.) The share of proxy interviews was also noticeably high but the measurement error due to oblivion and denial was reduced by the formulation of questions on whole-year information.

According to the youth module, about 90 thousand full-time students aged 15–29 were working during the past 12 months by the following splits:

– only during school terms: 16 thousand persons (of which 8 thousand regularly),
– only between school terms/holidays: 43 thousand persons,
– during school terms and holidays: 31 thousand persons (of which 10 thousand regularly).

The universe of regularly working students equals to 18 thousand persons according to the LFS methodology. This value should be raised by the number of holiday workers in the months of July and August. It is apparently not the case on the basis of the core survey.

All together the penetration rate of students is not very high. 7.2 percent of full-time pupils aged 15–19 were working during the past 12 months, of which every fifth regularly. (Work is allowed legally after the age of 16.) This type of income earning activity is more typical for students aged 20–24. 18 percent of them were working, but the share of regulars was not higher than it was in the younger age group.

Table 2

The type and frequency of work done by youth during full-time education, 2006*
(percent)

Denomination	Work* done in the previous year during full-time education					
	during school holiday and school year		during school year		only during school holiday	*total*
	regularly	occasionally	regularly	occasionally		
Distribution of persons worked during full-time education (persons)	10.8	24.1	9.1	8.3	47.7	*100.0*
Of which:*						
compulsory traineeship, vocational training	11.6	26.0	14.6	11.5	36.3	*100.0*
non-compulsory traineeship, vocational training	14.6	26.0	6.3	6.0	47.0	*100.0*
work organised by school	20.7	39.0	13.8	2.4	24.0	*100.0*
work transmitted by fraternity	12.2	34.4	3.0	6.3	44.1	*100.0*
other work	12.9	21.4	4.5	3.7	57.5	*100.0*

* All types of work are included.
Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

Table 3

The type of work done by youth aged 15–29 during full-time education, 2006*

Sex	The type of work* done in the previous year during full-time education									
	compulsory traineeship, vocational training		non-compulsory traineeship, vocational training		work organised by school		work transmitted by fraternity		other work	
	yes	no	yes	no	yes	no	yes	no	yes	no
Male	26 452	25 619	4 722	47 350	5 632	46 439	10 933	41 139	22 432	29 639
Female	15 765	22 191	2 646	35 312	3 555	34 402	11 828	26 127	16 228	21 730
Both sexes	*42 217*	*47 810*	*7 368*	*82 662*	*9 187*	*80 841*	*22 761*	*67 266*	*38 660*	*51 369*

* All types of work are included, multianswer was possible.
Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

The other segment of the youth module focused on the type of work. The total number of observations was about 120 thousand. (See Table 3.) 35 percent of the to-

tal was related to obligatory professional practice. It was followed by the – mainly self-organised – other type work with 32 percent, while on the third place the student co-operation organised work of 19 percent can be found. This latter kind is quite popular among students since about 22.6 thousand cases of such type of work were recorded.

Information from student co-operatives can be used as a verification of data of the youth module. It can directly be compared to the number of persons reported "working with student co-operatives". The HCSO contacted the eight most important student co-operatives and obtained the following data:

> These student co-operatives had 63 500 registered members as an annual average in 2007 of which 44 thousand persons worked seizing the job opportunities offered by the student co-operatives. The work type in about 10 percent of these 44 thousand cases is not known. A monthly average of 4.5 thousand people from a further 40 thousand was working during school terms, while 7.6 thousand persons were working in holiday. Presumably, persons working during school terms were also engaged in working in summer holiday. At the same time, the number of persons considered to be regularly working during the whole year hardly reached the number of one thousand.

There is a considerable difference between the data of the core LFS and the youth module, which is difficult to measure because of the following reasons:

> – In the module the annual headcount of concerned persons was asked, while quarterly average headcount data were available based on the core survey.
>
> – Headcount as a common indicator was rejected. Working time data were used as a starting point. Actually, the worked hour data of the core survey were transformed into annual data, like ad-hoc module information.

In the youth ad-hoc module the annual worked time could be recorded in number of days and number of hours as well. The majority of respondents (97.7%) answered in terms of days. Annual working hour data based on number of days were produced by empirical multipliers.

Obligatory professional practice included in the employment related questions of the module was measured and multiplied as well. It can not be interpreted as employment but as part of the educational program in the Hungarian educational system. Full-time students reporting only obligatory professional practice as work were

excluded from data production for the current study. Data production related to the supplementary survey was completed by using information of the core LFS (gender, age-group, economic activity, educational level). (See Table 4.)

Table 4

Youth in full-time tertiary education who performed work in the previous year, 2006*
(persons)

Sex and field of education or training	Work done in the previous year during full-time education					
	during school holiday and school year		during school year		only during school holiday	*total*
	regularly	occasionally	regularly	occasionally		
	by gender					
Male	2 331	3 743	1 035	812	5 577	*13 498*
Female	716	3 353	280	1 260	6 570	*12 179*
Total	*3 047*	*7 096*	*1 315*	*2 072*	*12 147*	*25 677*
	Of which: by field of education or training (FET)**					
FET 1	211	548	78	268	2 660	*3 765*
FET 2	187	340	203	109	912	*1 751*
FET 3	1 603	2 012	148	809	2 953	*7 525*
FET 4	726	2 351	550	100	1 690	*5 417*
FET 5	320	181	94	590	1 555	*2 740*
FET 6	0	0	0	0	52	*52*
FET 7	0	752	243	0	761	*1 756*
FET 8–9	0	210	0	197	1 563	*1 970*

* Compulsory traineeship and vocational training are excluded.
** Persons with FET 0 are excluded.
Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

The findings of the research focused on the reliability of data on the number of persons working besides studies are summarised here:

– Working besides studying on day-time courses has got different social traditions and penetrations by countries. It stands a better chance to be reflected correctly by LFS in countries having long tradition in this field. More realistic information can be obtained, if the referred person will answer the question him/herself. It has a higher chance if the respondents are selected on personal level or there is a consider-

able share of young people living separately from their parents in households available for the survey, which is the case for example in Nordic countries. Neither of these findings covers the Hungarian situation; consequently LFS underestimates the number of students working besides studying. Only every second or third referred person can be qualified as employed compared to the real situation.

– If the aim is to monitor the working habits (working time, goal) of students in an internationally comparable way, then an ad-hoc module can be the appropriate form (for example the next wave of the ad hoc module "Transition from school to work").

– It has to be considered whether the full-time students should be left out from the employed – at least for some of their indicators – during school term. As the support for this decision, the youth employment rates of different countries have to be analysed by age brackets according to the current LFS methodology.

2. People engaged in agricultural work

It is well known that the supplementary agricultural activity of households represents a significant quantity in Hungary, contributing to the improvement of their income situation. At the same time, the number of persons employed in agriculture as a main activity has been declining for years. According to the Labour Force Survey (LFS) data, 4.7 percent of the employed persons worked in agriculture in 2007. (It was 7.4 percent in 1998.) From another point of view, the number of persons registered as self-employed in agriculture did not reach 50 thousand (46.2) in 2007, which was 1.2 percent.

It is typical that the households' social and work related incomes are completed by agricultural activity. It has got two types. In the first case, a part of market consumption is replaced by agricultural production. In the second case, sales of agricultural products produce income.

According to the LFS definitions, if the respondent does one hour agricultural work, for example selling agricultural surplus products on a small scale on the reference week, it will be a sufficient condition of being qualified as an employed. But social and social insurance related incomes (for example child-birth related allowance, pension) have stronger characterising effect than incomes from agricultural selling. If the latter one is not significant in determining the income situation of the household or its aim is not specifically agricultural product production (which is true in most cases), it will not indicate a positive answer to the question about one-hour income earning activity the week before. Because of the "overlooking" of this mar-

ginal agricultural income, those people will be also classified as inactive who – although they satisfy the condition of one hour earning activity – have been considered as employed theoretically. The basic concept of LFS gives priority for employed status against unemployed or inactive status. If there is no social income besides agricultural work, there will be a higher chance for a respondent producing agricultural product only for own consumption to be classified as employed.

Supplementary agricultural activity, but even information related to involvement in agricultural activity has been included in the questionnaire of the first quarter module three times since 2004. Its formulation is shown by Figure 3.

Figure 3. A question of the LFS Supplementary Survey questionnaire concerning agricultural work, Quarter 1, 2005–2007

Inclusion of this question block makes the study of engagement in agricultural activity combined with labour market status including information on the volume of work possible. (How many days did he/she do agricultural work?) This question provides for the possibility to filter out hobby workers in agriculture. For the classification of the employed, information would be needed about whether the agricultural product was marketed. This question block did not produce information regarding this problem.

Table 5

Persons who performed agricultural work by economic activity and by time spent in this work, 2004–2006*

Economic activity*	Agricultural work			Population aged 15–74 answered	Agricultural work			Population aged 15–74 answered
	done during the whole year	done not during the whole year	not done		done during the whole year	done not during the whole year	not done	
	persons				percent			
	2004							
Employed	137 900	1 003 256	2 700 342	3 841 498	3.6	26.1	70.3	100.0
Unemployed	5 955	88 916	199 962	294 833	2.0	30.2	67.8	100.0
Inactive	93 576	1 106 681	2 327 737	3 527 994	2.7	31.4	66.0	100.0
Total	*237 431*	*2 198 853*	*5 228 041*	*7 664 325*	*3.1*	*28.7*	*68.2*	*100.0*

(Continued on the next page.)

(Continuation.)

Economic activity*	Agricultural work			Population aged 15–74 answered	Agricultural work			Population aged 15–74 answered
	done during the whole year	done not during the whole year	not done		done during the whole year	done not during the whole year	not done	
	persons				percent			
	2005							
Employed	129 811	933 236	2 808 787	3 871 834	3.4	24.1	72.5	100.0
Unemployed	6 362	103 717	212 058	322 137	2.0	32.2	65.8	100.0
Inactive	81 420	1 032 733	2 385 102	3 499 255	2.3	29.5	68.2	100.0
Total	*217 593*	*2 069 686*	*5 405 947*	*7 693 226*	*2.8*	*26.9*	*70.3*	*100.0*
	2006							
Employed	115 183	1 012 452	2 757 744	3 885 379	3.0	26.1	71.0	100.0
Unemployed	4 606	101 869	207 526	314 001	1.5	32.4	66.1	100.0
Inactive	50 189	1 052 929	2 376 359	3 479 477	1.4	30.3	68.3	100.0
Total	*169 978*	*2 167 250*	*5 341 629*	*7 678 857*	*2.2*	*28.2*	*69.6*	*100.0*

* Quarter 1, following the reference year.
Source: HCSO, Supplementary Survey of LFS, Quarter 1, 2005–2007.

From the point of further researches the most interesting category is persons engaged in agricultural activity during the whole year. The number of persons in this category was between 237.4 thousand and 169.9 thousand in 2004–2006, decreasing continuously. (See Table 5.) It is in accordance with other data sources, such as the Household Budget Survey (HBS), which showed a decline in the supplementary agricultural activity of households in the same period.

Among persons engaged in agricultural activity during the whole year, the employed people worked mostly in the agricultural sector. It provides opportunity to test the quality of this question block, but this group is not the matter of further researches.

The last available data for 2006 show 4 606 unemployed persons and 50 189 people with inactive status, engaged in agricultural activity during the whole year. Among them 49 549 were unemployed or inactive during the whole year observed. It is practical to filter out persons likely to be employed from the universe of these people.

The method was the following:

1. Persons aged over the national employment age limit were excluded (the employment age limit was set at 61). This reduced head-

count into its half. This is reasoned by the fact that people aged 62 and over must receive pension. In their case any agricultural activity is considered to be supplementary, daily routine activity.

2. Inactive or unemployed persons who are engaged in agricultural activity during a whole year and have got a self-employed family member working in agriculture must be considered as employed, namely family helpers. (See Table 6.)

Table 6

The number of unemployed and inactive persons aged 19–61 by whom agricultural work was done during the whole year by type of subsidies received, 2004–2006

Sex	Persons								
	Total	received subsidies						did not receive subsidies	having at least one person in their households who was self-employed in agriculture
		subtotal	of which						
			child-birth related allowance	old-age pension/allowance	disability pension/allowance	job seeking assistance	other subsidies		
					2004				
Male	*27 222*	*20 049*	225	4 291	11 589	3 944	0	7 173	713
Female	*27 495*	*19 268*	3 508	4 920	8 790	1 856	194	8 227	1 723
Both sexes	*54 717*	*39 317*	*3 733*	*9 211*	*20 379*	*5 800*	*194*	*15 400*	*2 436*
					2005				
Male	*21 805*	*14 755*	385	3 908	7 763	2 699	0	7 050	831
Female	*25 101*	*16 389*	2 247	5 153	6 571	2 121	297	8 712	1 009
Both sexes	*46 906*	*31 144*	*2 632*	*9 061*	*14 334*	*4 820*	*297*	*15 762*	*1 840*
					2006				
Male	*14 401*	*9 961*	0	2 642	5 362	1 760	197	4 440	533
Female	*14 845*	*9 243*	1 575	2 400	3 464	1 622	182	5 602	896
Both sexes	*29 246*	*19 204*	*1 575*	*5 042*	*8 826*	*3 382*	*379*	*10 042*	*1 429*

Source: HCSO, Core Survey of LFS, 2006; Supplementary Survey of LFS, Quarter 4, 2006.

Using these figures we made the following calculation to estimate the number of "missing" agricultural workers for 2006. (See Table 7.)

Table 7

*Estimation of the number of potentially employed persons by whom agricultural work was done during the whole year, 2006**

	Denomination	Persons
1.	*Persons aged 15–74*	*169 978*
	Of which:	
2.	not employed	54 795
3.	not employed during the whole year	49 549
4.	aged not 19–61	20 303
5.	having a self-employed family member who worked in agriculture	1 429
6.	**6. = 3. – 4. – 5.**	27 817
7.	Multiplying factors$_1$**	0.5
8.	Multiplying factors$_2$**	0.8
9.	Estimated total$_1$ (**9. = 6. × 7. + 5.**)	15 338
10.	Estimated total$_2$ (**10. = 6. × 8. + 5.**)	23 683
11.	Estimated total average (**11. = (9. + 10.)/2**)	19 510

* On the basis of data given by respondents in Quarter 1 following the reference year.
** Multiplying factor for persons working at most 30 hours in a year.
Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

About half or two thirds of the remained "mixed" group are likely to be employed based on experts' opinion. The estimation set out from the number of persons engaged in agricultural activity during the whole year gave about 19 500 employed persons as a surplus in 2006. There is a greater universe of people reported not full year agricultural activity. Thus, the number of not employed persons reporting not full year agricultural activity was above 1 million in every year. (See Table 8.)

The same method (namely the exclusion of persons older than 61 years and the determination of probability scale based on existing agricultural self-employed family members) was used for filtering as it was developed for persons reporting agricultural activity during the whole year. According to the ad-hoc module, about 2 167 thousand people did some agricultural work in 2006, among which almost 527 thousand individuals aged 19–61 were non-employed in the whole year. (See Tables 8 and 9.)

A volume limit was added to the former criteria based on the following question: "How many days did you do agricultural work during the year?" It can be seen that more than 60 percent of the persons in question did work of less than 30 days. They were excluded from the further research. The group of inactive or unemployed persons aged less than 62, who were doing at least 31-day agricultural work, constitutes a smaller part of the total universe.

Then persons with agricultural self-employed family members were selected, and they were classified as family helpers. After this, according to the number of worked days different multiplying factors were applied, and the number of the employed was determined. The multiplying factors were as follows: 31–60 days 0.1; 61–90 days 0.3; 91–180 days 0.5; 181– days 0.8.

The multiplying factors reflect the characteristics of agricultural activity such as it is in limited extent for market production (that's why people, who worked more than 180 days, received just 0.8 as a multiplying factor although they were working almost during the full agricultural season).The probability that a respondent was doing agricultural work on the reference week is higher, if he/she reported a higher number of working days during the year. It is also reflected by the multiplying factors.

Table 8

The number of persons aged 15–74 who performed agricultural work not during the whole year by economic activity, 2004–2006*

Economic activity*	Agricultural work performed for						*Total*
	less than 31	31–60	61–90	91–180	181–270	more than 271	
	days						
				2004			
Employed	682 808	183 777	55 283	70 529	9 079	1 780	*1 003 256*
Unemployed	55 123	18 851	6 742	7 697	503	0	*88 916*
Inactive	654 015	242 669	92 637	103 365	12 988	1 007	*1 106 681*
Total	*1 391 946*	*445 297*	*154 662*	*181 591*	*22 570*	*2 787*	*2 198 853*
				2005			
Employed	650 590	160 424	49 353	63 023	8 392	1 454	*933 236*
Unemployed	63 632	20 893	7 312	11 220	660	0	*103 717*
Inactive	640 746	213 828	71 942	93 656	12 417	144	*1 032 733*
Total	*1 354 968*	*395 145*	*128 607*	*167 899*	*21 469*	*1 598*	*2 069 686*
				2006			
Employed	733 556	150 848	52 142	66 390	9 023	493	*1 012 452*
Unemployed	65 143	19 667	5 409	9 473	2 054	123	*101 869*
Inactive	688 821	201 180	64 518	88 358	9 138	914	*1 052 929*
Total	*1 487 520*	*371 695*	*122 069*	*164 221*	*20 215*	*1 530*	*2 167 250*

* Quarter 1 following the reference year when the interview was carried out.
Source: HCSO, Supplementary Survey of LFS, Quarter 1, 2005–2007.

Table 9

The number of all the year round unemployed or inactive persons aged 15–74 who performed agricultural work not during the whole year by age-group, 2004–2006

Age-group	Agricultural work performed for						*Total*
	less than 31	31–60	61–90	91–180	181–270	more than 271	
	days						
				2004			
19–29	74 378	13 637	6 063	4 410	372	0	*98 860*
30–39	50 359	18 034	6 318	8 084	1 144	0	*83 939*
40–49	60 008	22 940	9 547	9 179	1 563	202	*103 439*
50–61	156 393	62 706	23 737	28 519	3 776	351	*275 482*
62–74	257 912	114 245	42 738	46 016	4 759	84	*465 754*
Other	50 531	6 026	2 170	373	252	69	*59 421*
Total	*649 581*	*237 588*	*90 573*	*96 581*	*11 866*	*706*	*1 086 895*
				2005			
19–29	72 095	14 084	3 440	4 351	437	0	*94 407*
30–39	50 380	15 341	5 520	7 019	209	0	*78 469*
40–49	52 224	16 949	7 269	9 451	923	0	*86 816*
50–61	152 709	56 110	18 204	28 258	3 473	64	*258 818*
62–74	259 192	103 261	36 151	44 185	6 453	80	*449 322*
Other	45 663	5 870	1 104	527	0	0	*53 164*
Total	*632 263*	*211 615*	*71 688*	*93 791*	*11 495*	*144*	*1 020 996*
				2006			
19–29	72 367	11 785	3 148	3 319	409	123	*91 151*
30–39	55 399	11 844	4 096	6 896	1 288	0	*79 523*
40–49	50 532	18 573	4 856	7 074	482	0	*81 517*
50–61	172 745	55 357	17 453	26 661	2 396	40	*274 652*
62–74	285 176	99 249	33 660	40 977	5 336	874	*465 272*
Other	47 081	3 926	1 194	391	0	0	*52 592*
Total	*683 300*	*200 734*	*64 407*	*85 318*	*9 911*	*1 037*	*1 044 707*

Source: HCSO, Supplementary Survey of LFS, Quarter 1, 2005–2007.

Summing up the results, the estimation has produced about 68 thousand employed persons as a surplus, which is a bit under the preliminary expectations. (See Tables 7 and 10.) It would raise the 50.9 percent employment rate of persons aged 15–74 by 0.8 percent points (51.7%).

Table 10

Estimation of the number of potentially employed persons who performed agricultural work not during the whole year, 2006

Denomination	Agricultural work performed for					*Total*
	1–30	31–60	61–90	91–180	181–	
	days					
1. Persons aged 15–74	*1 487 520*	*371 695*	*122 069*	*164 221*	*21 745*	*2 167 250*
Of which:						
2. not employed	753 964	220 847	69 927	97 831	12 229	*1 154 798*
3. not employed who worked in agriculture	683 300	200 734	64 407	85 318	10 948	*1 044 707*
4. aged not 19–61	332 257	103 175	34 854	41 368	6 210	*517 864*
5. having a self-employed family member who worked in agriculture	6 417	3 073	1 014	1 102	224	*11 830*
6. **6. = 3. – 4. – 5.**	344 626	94 486	28 539	42 848	4 514	*515 013*
7. Multiplying factors	0.0**	0.1	0.3	0.5	0.8	–
8. Estimated total (**6. × 7. + 5.**)*	0	12 521	9 575	22 526	3 835	*48 457*

* Quarter 1 following the reference year.
** Multiplying factor for persons with at most 30 hours in a year.
Source: HCSO, Supplementary Survey of LFS, Quarter 4, 2006.

*

On the basis of the results, it is very likely that LFS underestimates the employment rate of students and the role of agricultural employment. It contributes – although not significantly – to the low employment rate of population aged 15–64. It is strengthened by the classification of persons receiving maternity related benefits since they are classified as inactive regardless of their employment status according to the strict LFS methodology. This methodological concept is not consistently observed by all countries (for example Austria) or it can not be complied in consequence of national regulation. (In Sweden the virtual activity of mothers with little children is higher than in Hungary because the period of child caring can be used freely as a time bracket.) Gainful activities (especially occasional work or work in the informal economy) besides receiving child care related benefits remain hidden in LFS similarly to working besides pension or regular benefits.

To sum up the results, the national employment rate would exceed the current level if LFS was the perfect measuring tool. It is not likely that Hungary can improve

its place in the rank of EU member states (but we can be closer to the value of Romania, where the persons engaged in agricultural activity for production for own consumption are considered to be employed, as with the practice in Portugal). Similar underestimation due to other reasons is conceivable in other member states. We do not neglect the fact that the strength of LFS does not rely on the determination of levels but on the measurement of move in time and in international comparison.

Current Price Approach of Quarterly GDP Estimations from Production Side in Hungary*

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Quarterly national accounts due to their timeliness constitute a central instrument for short-term economic analysis, monitoring, forecasting and at the same time play a vital role for economic and monetary policy makers.

Earlier, Hungarian quarterly GDP on production side was compiled by an indicator method (volume projection) following the UK practice, that is to say, available indicators were used to extrapolate the value added series.

Later on, ECB (European Central Bank), Eurostat and also EU regulations expressed a strong need for quarterly sector accounts and current price GDP figures from the EU members and the accession countries (*EC–ECB* [2000], *ECOFIN* [2005]; *Official Journal…* [2005]) .

At the end of 2006, Hungary introduced full current price quarterly estimations – namely developed the current price approach on production side – based on statistical and administrative data sources. Therefore I found it important to share some of its methodological aspects.

KEYWORDS:
GDP.
Estimation.
National accounts.

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There is no reference to quarterly national accounts in the System of National Accounts 1993 (*UN* [1993]), though it has an essential role as the European System of National Accounts 1995 expresses: "The importance of quarterly accounts derives essentially from the consideration that they are the only coherent set of indicators, available with a short time-lag, able to provide a short term overall picture of both non-financial and financial economic activity." (*Eurostat* [1996] 12.02.).

It defines quarterly national accounts (QNA) as an integral part of the system of national accounts and a coherent set of transactions, accounts and balancing items, defined in both non-financial and financial domain, recorded on a quarterly basis. They adopt the same principles, definitions and structure as the annual accounts, therefore they have to be consistent over time with them.

The period of time to which the quarterly accounts relate and the strong need to have reliable information as quickly as possible determine certain typical features. These features include statistical methods of compiling accounts, seasonality and the treatment thereof, the consistency of quarterly and annual accounts and some account particularities related to the reference period. Therefore the statistical methods used for compiling quarterly accounts may differ from those used for the annual accounts.

Data sources for the annual accounts are generally different, more exhaustive, reliable and comprehensive than the corresponding ones of the quarterly accounts. In many cases, data are collected only at annual frequency, and at a higher frequency, only indicators or proxies are available, if any. This implies that annual national accounts play a leading role and serve as a reference benchmark for the quarterly national accounts (*Eurostat* [1999]).

The most frequently used indicator to describe the short-term economic movements is GDP and therefore it has an essential role in QNA.

1. Hungarian background

Hungary started the methodological preparation for the compilation of quarterly GDP in 1993. It was followed by establishing methodological work and experimental calculations. As a result, the quarterly GDP estimates were first published in July 1996. Even then, they were prepared by both production and expenditure approaches with the beginning of the first quarter of 1995.

The production approach was based on an indicator method, namely on volume projection following the UK practice. Its main idea was to use available proxy indicators such as the industrial production index to extrapolate value added of the industries of the base year at the two-digit level of NACE (Nomenclature générale des activités économiques dans les Communautés Européennes) Revision 1. This means that quarterly GDP from the production side was available only in index form and at constant prices. Volume indices were aggregated by using the shares of industries in the total value added of the base year (1995, 1998, and then 2000) as weights (*KSH* [2002]).

This method was based on the hypothesis that in short-term basis, the growth rate of gross value added corresponds to the mid-year volume changes of production. However, on the one hand the structural and technological changes in the Hungarian economy and the growing role of multinational capital in some branches caused that there was no strong correlation between the run of volume indices of production and that of gross value added even at the annual level.

On the other hand, a methodological gap arose in the quarterly estimations due to the fact that the expenditure approach was based on current price estimation, while on production side quarterly GDP was calculated indirectly by the volume projection method.

Moreover, the EU regulations urged data transmission of current price quarterly national accounts from the EU members and the accession countries as well.

2. Sources and methods

An important aspect of the quality of QNA is the closeness of the indicators and values used for the quarterly estimation to the corresponding sources used for the annual one. The basic principle in selecting and developing sources of the quarterly GDP compilation was to obtain indicators, figures that best reflect the items being measured. In some cases source data were available in a form ready for use in the estimation with little or no adjustment. In other cases, the source data differed from the ideal in some way, so they needed to be adjusted. In this case benchmarking is proposed as a main tool in the adjustment.

According to the Handbook on Price and Volume Measures in National Accounts, "Value added at current prices is defined as the difference between output (at basic prices) and intermediate consumption (at purchasers' prices). Value added is therefore a balancing item in the system of national accounts. There is conceptually no price or volume component of value added, since it is essentially an income concept. However, if GDP volume growth is calculated according to the production approach, the value

added of all branches is summed (plus taxes less subsidies on products), so that it is necessary to have a measure of value added at constant prices." *Eurostat* [2001].

The ESA 1995 defines value added at constant prices as the difference between output and intermediate consumption at constant prices:

$$VA = \sum P_0 \cdot Q_0 - \sum P_{IC} \cdot Q_{IC}$$

where P_0 and Q_0 are prices and quantities for output and P_{IC} and Q_{IC} are prices and quantities for intermediate consumption. Theoretically, the correct method to calculate value added at constant prices is double deflation, namely deflating separately the two flows of the production account (output and intermediate consumption) and calculating the balance of these two deflated flows. According to the definitional relationship, if two (the prices and the volumes) out of the values are available, the third can be derived for the output and intermediate consumption. While as a consequence of the double deflation principle for value added, only if the values and volumes are accessible, prices can be obtained implicitly.

Therefore it was necessary to calculate output and intermediate consumption as a starting point by using appropriate data sources and estimation methods to provide gross value added (GVA) at current and constant prices. In this light, the experimental calculations were based on independent compilation of the production part of sector accounts at current and constant prices.

It has to be emphasized that current price calculations should be mixed with estimations based on volume measures due to lack of available information within a short time-lag available in each quarter. This should be mainly applied for the estimation of intermediate consumption of the non financial corporation sector.

It made the accomplishment of the task difficult and hence several methodological changes introduced between 1995 and 2004 were only carried out partly or not at all. As the development of compilation methodologies and backward calculation (retrapolation) need considerable resources, the execution of the task was planned in several steps. First, we undertook to prepare the time series for the period beginning with 2000 and the calculation methodology for the actual quarters. Then, as a further step, backward series could be compiled. This consideration was based on the following ESA concept:

"The statistical methods for compiling quarterly accounts may differ quite considerably from those used for the annual accounts. They can be classified in two major categories: direct procedures and indirect procedures. Direct procedures are based on the availability at quarterly intervals, with appropriate modifications, of the similar sources as used to compile the annual accounts. On the other hand, indirect procedures are based on time disaggregation of the annual accounts data in accordance with mathematical or statistical methods using reference indicators which permits the extrapolation of the cur-

rent year. […] The choice between these approaches depends, among other things, on the information available at quarterly level." (*Eurostat* [1996] 12.04.).

The methodological work started in 2003 by analyzing the available short-term statistical and administrative data sources and determining the coverage between the available data and the needed ones.

2.1. Connections between business statistics and production accounts of non-financial corporations

The main available mid-year data source is the short-term business statistics introduced in 1998, which provides a starting point for the quarterly current price estimation of gross value added, mainly for its biggest sector, the non-financial corporation sector. Due to the limited length of this paper I would like to focus only on some methodological aspects related to the compilation of this sector. Though in the first step we concentrated on the decomposition of the annual current price data for the period of 2000–2002, data of 1998–1999 were also analyzed. Besides the short-term business statistics, data of the annual ones were also used as a control.

Data sources used at the starting point:

– Integrated short-term business statistics 1998–2002,
– Integrated annual business statistics 1998–2002,
– Annual current price data of national accounts (NA): 1998, 1999, 2000 – new methodology, 2001, 2002 – preliminary.

The data sources changed even in content during the studied period (NACE modification, new Hungarian Accounting Law in 2001, new NA methodology from 2001 with new base year of 2000). Furthermore, annual NA data for the year 2001 and 2002 were also changed because of government account's retrapolation.

To be able to use short-term business statistics data for NA estimations, firstly connections among annual current price data of the three mentioned sources should be analyzed. This was done at two-digit level for gross output and intermediate consumption. Through the work, differences between data of integrated business statistics and those of NA, as well as their possible reasons were analyzed step by step.

2.2. Coverage of observation

The questionnaire system of integrated business statistics is based on categories of the number of employees. In the higher categories there is a full-scope observa-

tion; in the case of corporations with lower staff number, observations are representative. The corporations with less than five employees are out of the observation; their data are estimated by a model.

Integrated short-term business statistics:

> The corporations with more than 50 employees are fully observed (with imputations).
>
> Observation of corporations with staff number between 5–49 employees is representative (with imputations, grossing up).

Integrated annual business statistics:

> The corporations with more than 20 employees are fully observed (in construction: 10 employees) (with imputations).
>
> Observation of corporations with staff number between 5–19 employees is representative (with imputations, grossing up).

In the national accounts the observation is based on sectors and not on the number of employees. The main source of production account for non-financial corporations is the annual tax declarations (*KSH* [2007]). The relevant information of tax declarations are extended by data obtained from annual business statistics. For some industries industrial statistics are also used. To establish the whole dataset, condition codes of the Hungarian Business Register at the end of the previous year or later are taken into consideration besides tax declarations and other data sources according to the ESA 1995 rules.

The national accounts and the integrated business statistics treat differently the data of companies transformed, newly formed, or terminated during the year. For example a company transformation occurred during the year is followed by integrated short-term business statistics in the same month or quarter in case of branch changes; in the integrated annual business statistics the whole-year data appears under the identifying code of its successor or predecessor in its branch, while the national accounts estimate the predecessor according to the previous year's data and use the real data for the successor.

2.3. Different terminologies and calculation methods

There were no data for intermediate consumption in the integrated short-term business statistics. The production value and its components were asked in an integrated questionnaire with contents prescribed in the regulations of integrated short-term business statistics and those of integrated annual business statistics.

There were no important changes in the structure of the integrated business statistics during the period of 1998–2002. Though in 2001, due to the changes in the Hungarian Accounting Law, the content of net sales was changed and supplemented with consumption tax and excise duty. Also in 2001, the category of value of subcontracting services ceased to exist in accounting, and a new category, the value of services purchased for resale was applied, which does not have the same content as the previous category.

In the national accounts the term of gross output differs in several points from the production value of business statistics because of ESA 1995 regulations. Several changes were made in the compilation of the gross output of the non-financial sector in order to follow the changes and meet the international methodology. The methodological changes introduced in 2001 cause breaks in the time series of national accounts. The data for the period of 1998–1999 are consistent with the data of 2000 calculated according to the former methodology, and data from 2001 are consistent with the data of 2000 calculated based on the new methodology. From 2001, because of the mentioned changes in the Hungarian Accounting Law, net sales contain the consumption tax and excise duty even in the tax declarations. Though, in order to maintain the consistency, these taxes are not included within the items modifying the basic price in the calculation scheme for the query of the database, but in the net sales figures consumption tax and excise duty were imputed.

2.3.1. Basic price – purchaser's price

From 2001 consumption tax and excise duty are included in the production value data of integrated short-term business statistics, while they are excluded from the gross output of NA because of the valuation at basic price.

2.3.2. Other differences between annual and quarterly estimates

In the national accounts there is a special estimation for hidden economy. It raises the gross output, though such type of estimation is not included in the integrated business statistics.

There is a difference between business accounting and national accounting standards in terms of major processing on the imported goods. In business accounting and in profit and loss statements it is recorded on a net basis on the grounds that there has been no change of ownership between residents and non-residents. Turnover data coming from the bookkeeping system includes only the processing fee.

ESA 1995 recommends that cross-border movements under major processing arrangements should be treated as trade in goods, rather than services, and valued on a gross basis. According to the basic concept of this treatment the product becomes

different from its original state after processing. This means that due to an economic event the import and export of goods concerned can not be ignored.

Based on the joint methodological improvement of balance and payments, the national accounts import/export flows connected with the major processing are recorded on a gross basis in accordance with the foreign trade statistics. In order to obtain consistent figures for import and intermediate consumption, as well as for exports and gross output, the intermediate input and output figures based on the business accounting data need to be grossed up by an imputation. As a result of this adjustment, the gross output and the intermediate consumption are grossed up with the same amount.

A special element of the Hungarian economy is that consumers provide tips in case of certain service activities. In the interest of exhaustiveness, the output has to be increased by the estimated value of tips. Nevertheless, business statistics do not contain data for tips.

The enterprises with off-shore (special purpose entity [SPE]) status are included in the business statistics but only their employment data are available. This reduces the coverage ratio between data from the two types of sources.

After filtering out these differences from the two types of data series, coverage in most of the branches was near 100 percent.

3. Results

As a consequence, the short-term business statistics seemed appropriate sources to estimate gross output at current prices for the non-financial corporations sector for most of the branches. To compile backward time series, the quarterly decomposition method was applied, and for the actual quarter the gross output (GO) time series were extrapolated by using value indices based on business statistics data. This practice is applied by Germany as well.

The extrapolation is the easiest method from a mathematical and conceptual viewpoint (*Köves* [1981]). Its main hypothesis is that the figure x – in quarter t – and the quarterly unknown series y – in the same quarter – have the same time profile, that is to say, they increase at the same rate:

$$\Delta y_t = \Delta x_t \text{ , where}$$

$$\Delta y_t = \frac{y_t - y_{t-1}}{y_{t-1}}; \quad \Delta x_t = \frac{x_t - x_{t-1}}{x_{t-1}};$$

Therefore quarterly gross output was provided at current prices for most of the branches. For other branches like agriculture, other alternative estimation was developed.

Hungary has introduced chain-linking in QNA with current price approach on the production side. Chain-linking means constructing long-run price or volume measures by cumulating movements in short-term indices with different base periods. For example a period-to-period chain-linked index measuring the changes from period *0* to period *t* can be constructed by multiplying a series of short-term indices measuring the change from one period to the next (*Bloem–Dippelsmann–Maehle* [2001]). This series begins with the index measuring the change from period 0 to period 1 and ends with the index measuring the change from period *t*–1 to period *t*.

SNA 1993 recommends that the frequency of chain-linking should not be more than once annually. The Quarterly National Accounts Manual of IMF (*Bloem–Dippelsmann–Maehle* [2001]) mentions three possible techniques for annual chain-linking of quarterly data: annual overlaps, one-quarter overlaps and over the year technique. Though later on, Eurostat proposed the elimination of the last technique. Hungary has applied the annual overlap method like most of the EU member states and even Eurostat (*Eurostat–ECB* [2007]).

According to this applied chain-linking method, current price gross output data were deflated first to previous year average prices, and then the series were linked back to the reference year prices (average prices of 2000) to achieve all the series in a common price. The obtained time series were in 2000 year prices, consequently the year 2000 is only the reference year. The base year that determined the structure is the previous year for all data of the series, thus the base year annually differs. The value of this chain-linked index series beginning with 2000 for the second quarter of 2003 can be expressed as the following:

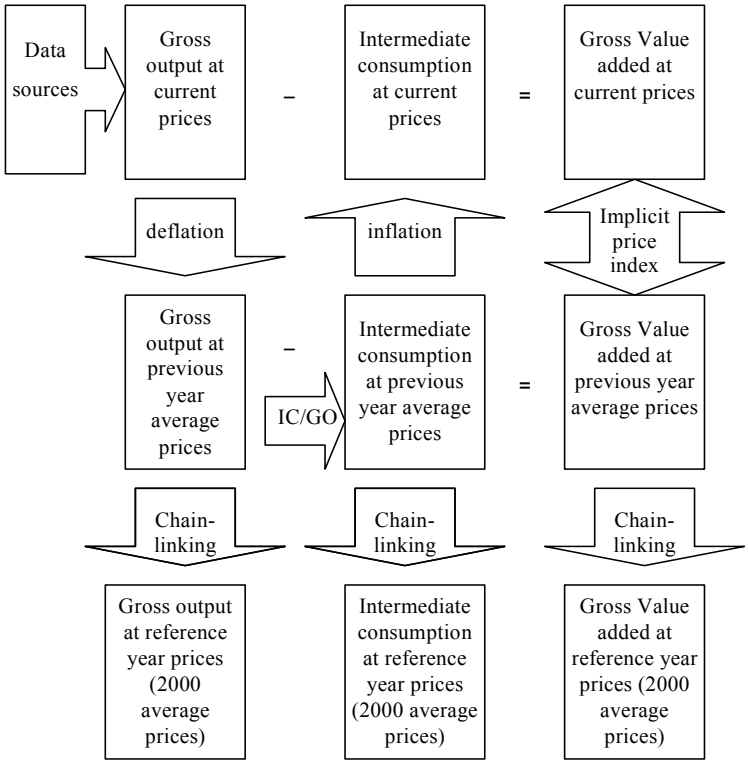
$$\frac{\sum_{i=II}^{IV}\sum \overline{p}_{2000}q^{i}_{2001}}{\sum_{i=II}^{IV}\sum \overline{p}_{2000}q^{i}_{2000}}\cdot\frac{\sum_{i=II}^{IV}\sum \overline{p}_{2001}q^{i}_{2002}}{\sum_{i=II}^{IV}\sum \overline{p}_{2001}q^{i}_{2001}}\cdot\frac{\sum_{i=II}^{IV}\sum \overline{p}_{2002}q^{i}_{2003}}{\frac{1}{4}\sum_{i=II}^{IV}\sum \overline{p}_{2002}q^{i}_{2002}}\cdot 100\ ,$$

where p is the prices of the output, q is the quantities of the output and i indicates the quarter.

As a result, according to the definition of chain-linking, the data of time series at average prices of 2000 became non additive within the given quarter, therefore chain-linking has to be carried out separately for sub-aggregates and aggregates as well. But additivity within the year (for example time consistency) is automatically achieved due to the applied annual overlaps technique, which is its main advantage (*Anwar–Szőkéné-Boros* [2008]).

As in most of the countries, no short term source data are available for intermediate consumption (IC), thus an alternative method should be applied (*OECD* [1996]). The widespread international methodology to use the ratio of gross output and intermediate consumption from the annual accounts at constant prices was applied. However, due to chain-linking, these constant prices became previous year prices, namely current prices of the previous year. This method is used even by the UK and Germany. By this approach intermediate consumption at previous year prices could be achieved, and by inflation current price data became available. The described calculation process can be illustrated in the following figure.

Calculation process of quarterly GVA for non-financial sector



Source: Own source.

The quarterly deflation and inflation methods are built up consistently with the annual ones. The supply and use table at the CPA (Classification of Products by Activity) 60 level was applied to compile the deflators of output and those of intermediate consumption for the non-financial corporation sector by using adequate price in-

dices of products and services of the actual quarter as compared to the previous year average. The preliminary structural estimations of supply and use tables of the previous year were applied as weights to compute the deflators of gross output and those of intermediate consumption at the NACE 2-digit level.

Though current price value added figures with chain-linked series were published at the end of 2006, continuous methodological work and developments are required. This current price approach is based on statistical and administrative data sources. During the calculations, quarterly time series, consistent with available annual data, are extrapolated.

Constant price data are calculated according to the annual deflation, taking into consideration the characteristics of chain-linking quarterly data. Before chain-linking, the whole time series was compiled directly at the average prices of the base year taking into account the structure of the base year (2000). The main advantage of chain-linking is that the previous year weights reflect better the economic structural changes than the base year weight structure, which was changed at five-year intervals.

For each quarter an estimate for GDP is published twice. The first publication, called flash estimate, is published 45 days after the end of the quarter (*t*+45 days). This estimate is based on modelling due to lack of available detailed data. The second estimate, called regular estimate, is published 70 days after the end of the quarter (*t*+70 days). The results are published at a detailed level in the Hungarian Central Statistical Office (HCSO) online publication (http://portal.ksh.hu/pls/ksh/docs/eng/xftp/gyor/gdn/egdn20806.pdf.) Hungary follows the EU recommendations by this publication system, though some countries put their first publication earlier; others publish the detailed version later (*Lequiller–Blades* [2006]).

International comparison of calendars for quarterly GDP publication

Country	First estimate	Second estimate	Third estimate
Australia	*t*+60	–	–
Canada	*t*+60	–	–
France	*t*+42	*t*+50	*t*+90
Germany	*t*+44	*t*+54	–
Hungary	*t*+45	*t*+70	–
Italy	*t*+44	*t*+70	–
Japan	*t*+48	*t*+73	–
United Kingdom	*t*+25	*t*+56	*t*+86
United States	*t*+30	*t*+60	*t*+90

Source: *Lequiller–Blades* [2006].

As mentioned in the introduction, the consistency between the annual and quarterly accounts is an essential requirement of the system of accounts. The data sources of quarterly calculations are more limited in detail and coverage than those available for annual estimation because of data availability, collection cost and timeliness. Hence, in accordance with the revision policy of HCSO, as soon as the results of the annual GDP compilation are available, the quarterly ones are revised.

This happens twice a year. First revision takes place due to the preliminary annual calculations, which are available 9 months after the end of the current year. The second one occurs due to the final annual GDP calculations published 16.5 months after the end of the current year. These revisions affect the quarters of the current year and those following the current year, of which it constitutes the basis. Revisions provide the possibility to incorporate new and more accurate information into the estimates, and thus to improve their accuracy.

This revision policy is based on the ESA concept that: "Since quarterly accounts adopt the same framework as annual accounts they have to be consistent over time with them. This implies, in the case of flow variables, that the sum of the quarterly data is equal to the annual figures for each year." (*Eurostat* [1996] 12.06.).

References

ANWAR, K. – SZŐKÉNÉ BOROS, ZS. [2008]: A láncindexek alkalmazása a nemzeti számlákban. *Statisztikai Szemle*. Vol. 86. No. 7–8. pp. 713–731.

BLOEM, A. – DIPPELSMAN, R. – MÆHLE, N. [2001]: *Quarterly National Accounts Manual – Concepts, Data Sources and Compilation*. IMF Publication Service. Washington D.C. www.imf.org/external/pubs/ft/qna/2000/Textbook/index.htm

EC–ECB [2000]: *Action Plan on EMU Statistical Requirements*. Brussels.

ECOFIN [2005]: *Status Report on Information Requirements in EMU.* Brussels.

EUROSTAT [1996]: *European System of Accounts, ESA 1995*. Luxembourg.

EUROSTAT [1999]: *Handbook on Quarterly National Accounts*. Office for Official Publications of the European Communities. Luxembourg.

EUROSTAT [2001]: *Handbook on Price and Volume Measures in National Accounts*. Office for Official Publications of the European Communities. Luxembourg.

EUROSTAT–ECB [2007]: *Chain-linking of Quarterly National Accounts and Its Implications for Seasonal Adjustment: Theory and Practice.* Working Paper TF-SAQNA-27. Luxembourg.

KÖVES, P. [1981]: *Indexelmélet és közgazdasági valóság*. Akadémiai Kiadó. Budapest.

KSH [2002]: *A negyedéves bruttó hazai termék (GDP) számítási módszere Magyarországon.* Budapest.

KSH [2007]: *National Accounts Hungary 2004–2005*. Budapest.

LEQUILLER, F. – BLADES, D. [2006]: *Understanding National Accounts.* OECD. Paris.

OECD [1996]: *Quarterly National Accounts: Sources and Methods Used by OECD Member Countries*. Paris.

Official Journal of the European Union. [2005]: Regulation (Ec) No 1161/2005 of the European Parliament and of the Council of 6 July 2005 on the compilation of quarterly non-financial accounts by institutional sector. L 191. pp. 22–28. http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:191:0022:0028:EN:PDF

UN [1993]: *System of National Accounts.* Brussels, Luxembourg, New York, Paris, Washington D.C.

Indicators Monitoring the Contribution of Agriculture to Climate Change in the EU

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Climate change is among the greatest environmental, social and economic risks to the Earth. It is evident that the climate system has a higher temperature now than it had in the pre-industrial age. The average temperature of the air and the waters increases, which results in the melting of snow and ice, the rising of sea levels and a need for the adaptation of human life including agricultural production. Reliable information is essential on the driving forces and pressures on the climate in order that the impacts could be assessed and a proper mitigation strategy could be developed.

This study describes the relations between agricultural production and climate change. The different driving forces and environmental pressures are explained in detail. The paper presents the indicators monitoring the contribution of agriculture to climate change and the linkages and interactions between them. It aims at providing useful information for policymakers for the formulation of adequate mitigation and adaptation policy.

KEYWORDS:
Agriculture.
Climate.
Sustainable development.

The concept of sustainable development was defined by the Brundtland report (*Our Common future* [1987]), in 1987 as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". There are three components of sustainable development (economic development, social development and environmental protection), which are interdependent and mutually reinforcing pillars (*UN* [2005]).

The European Council of June 2006 adopted a renewed Sustainable Development Strategy for the enlarged EU that is based on the Gothenburg strategy of 2001. The renewed strategy sets overall objectives and targets for seven key challenges for the time period until 2010 (*Council of the European Union* [2006]):

– climate change and clean energy,
– sustainable transport,
– sustainable production and consumption,
– public health threats,
– better management of natural resources,
– social inclusion, demography and migration,
– fighting global poverty.

Climate change is the field within sustainable development that deserves most of the attention of researchers, policy makers and the general public nowadays. Policy makers recognized the importance of tackling the problem of climate change decades ago. The UN Framework Convention on Climate Change (UNFCCC) was adopted in 1992. It was followed by the Kyoto Protocol in 1997. In the EU, measures have been taken in order to reduce the emissions of greenhouse gases since the beginning of the 1990s. In 2000, the European Commission launched the first European Climate Change Programme (ECCP), which stimulated the adoption of several measures in this field including a proposal for emission trading of greenhouse gases and a proposal for regulating certain fluorinated gases. The Second European Climate Change Programme was launched in October, 2005. It explores further cost-effective options for reducing greenhouse gas emissions in synergy with the EU's "Lisbon strategy" for increasing economic growth and job creation. The objectives of the second ECCP include (*ECCP* [2008]):

– increased use of renewable energy (wind, solar, biomass) and combined heat and power installations,
– improvements in energy efficiency in buildings, household appliances and in industry,

– reduction of carbon dioxide emissions from new passenger cars,
– abatement measures in manufacturing industry,
– measures to reduce methane emissions from landfills,
– integration of climate change into the EU's Rural Development Policy,
– support scheme for energy crops,
– reduction of N_2O in soils,
– integration of climate change into the EU's Structural and Cohesion Funds.

In order that proper steps could be taken to reduce the emissions of greenhouse gases, statistical information on the driving forces and pressures related to climate change is essential for policy makers so that a strategy for mitigation could be worked out. Mitigation strategy includes measures that contribute to the change of economic activities for the sake of reduction in greenhouse gas emissions.

The adaptation strategy consists of measures that enable mankind to change their life and activities so that they would be adapted to the different climatic conditions. The effects of climate change should be estimated and assessed in order that an adequate adaptation strategy could be elaborated.

Statisticians have a role in the development of both the mitigation and adaptation strategies. While they have a crucial responsibility in the measurement of the contribution of the different economic activities in the emissions of greenhouse gases, they have a less important role in formulating the adaptation strategy.

As a result of previous research, a set of indicators on sustainable development in agriculture was presented (*Fekete-Farkas–Molnár–Szűcs* [2004]; *Fekete-Farkas et al*. [2007]; *Valkó–Fekete-Farkas* [2007], [2008]). The indicators are organized according to the four (economic, social, environmental and institutional) dimensions of sustainable development. A database has been set up and the indicators are being tested in terms of their capability in describing the sustainability of agriculture. In this paper, climate change related indicators are used.

1. Climate change and its relation with agriculture

In the last two centuries, the concentrations of carbon dioxide, methane and nitrous oxide have significantly risen as a result of human activities. The atmospheric concentration of carbon dioxide has increased from a pre-industrial value of about 280 ppm to 379 ppm[1] in 2005 (*IPCC* [2007]). As a consequence, global mean sur-

[1] ppm (parts per million) is the ratio of the number of greenhouse gas molecules to the total number of molecules of dry air.

face temperatures have risen by 0.74°C ± 0.18°C when estimated by a linear trend over the last 100 years (1906–2005). The rate of warming over the last 50 years is almost double that over the last 100 years (0.13°C ± 0.03°C vs. 0.07°C ± 0.02°C per decade) (*Trenberth et al.* [2007]).

The main direct impacts of climate change are as follows:

– frequent extreme weather patterns,
– changes in temperature patterns,
– changes in rainfall patterns,
– rising of the sea level because of melting of ice.

The indirect impacts include the change of territory or the extinction of species, increased frequency and volume of floods, reduced snow cover, worsened water availability in dry areas, changes in crop productivity, changes in tourist destinations, etc.

Carbon dioxide (CO_2) is the most important contributor to climate change with 82 percent of the total in terms of global warming potential (GWP).[2] Methane (CH_4) has a GWP 21 times that of carbon dioxide, while nitrous oxide (N_2O) has a GWP of 310. Methane emissions accounts for 9.7 percent of the greenhouse gas (GHG) emissions and nitrous oxide is responsible for 6.6 percent of it (*OECD* [2002]).

There is a two-way relation between agricultural production and climate change. Agriculture has a significant role in the contribution to climate change. Agriculture was responsible for 9 percent of the emissions of greenhouse gases in 2003, while 53 percent of methane and 66 percent of nitrous oxide was emitted by agriculture in the EU 25 (*Eurostat* [2008]). Besides, climate has a crucial impact on agricultural production especially on the production of crops. Therefore the adaptation of agricultural production to the different climatic conditions and to the effects of climate change is inevitable.

1.1. Effects of agriculture on the climate

Agriculture contributes to the climate change in the following ways:

– emissions of carbon dioxide,
– emissions of methane,

[2] Global warming potential (GWP): The ratio of the warming caused by a substance to the warming induced by a similar mass of carbon dioxide.

– emissions of nitrous oxide,
– land use, land-use change and forestry.

1.1.1. Emissions of carbon dioxide

Carbon dioxide is a greenhouse gas that is emitted in the largest volume as a result of human activities. Agriculture is a minor source of carbon dioxide emissions. In Hungary, 10 percent of the total carbon dioxide was emitted by agricultural production (*Bálint* [2006]). The majority of carbon dioxide emissions from agricultural sources originate from:

– use of fossil fuels for heating buildings and operating machinery,
– natural respiration of livestock,
– land-clearing methods such as burning,
– decomposition of soil organic matter (*Kirchmann–Thorvaldsson* [2000]).

1.1.2. Emissions of methane

In the European Union, the main sources of methane emissions in agriculture are the enteric fermentation of ruminant livestock and manure management. In Europe, 72 percent was the share of enteric fermentation, while 27 percent was the share of manure management among the sources of methane emissions from agriculture in 2006. (See Table 1.)

Table 1

Emissions of methane from agricultural sources in the EU, 1990–2006
(metric tons)

Sources of emissions	1990.	1995.	2000.	2005.	2006.
	year				
Enteric fermentation	8 712.9	7 634.6	7 312.7	6 933.1	6 930.9
Manure management	2 678.2	2 544.3	2 520.2	2 496.0	2 542.1
Rice cultivation	118.7	106.2	103.9	111.4	113.9
Agricultural soils	–31.5	–30.3	–29.7	–29.6	–29.6
Field burning of agricultural residues	43.9	29.9	27.3	23.6	22.7
Total emissions from agriculture	*11 522.2*	*10 284.7*	*9 934.4*	*9 534.4*	*9 579.9*

Source: *Eurostat* [2008].

From 1990 to 2006, the emissions of methane from enteric fermentation dropped by 27 percent in the EU. The decrease can be explained by diminishing ruminant livestock. Simultaneously, the emissions from manure management have decreased by 5 percent.

1.1.3. Emissions of nitrous oxide

Nitrous oxide (N_2O) is a potential greenhouse gas that is emitted from the soil through the processes of denitrification and nitrification. The use of nitrogen fertilizers is conducive to the emissions of nitrous oxide. Another source of nitrous oxide emissions is the solid waste of animals. The main sources of nitrous oxide emissions in agriculture are summarized in Table 2.

Table 2

Emissions of nitrous oxide from agricultural sources in the EU, 1990–2006
(metric tons)

Sources of emissions	1990.	1995.	2000.	2005.	2006.
	year				
Manure management	142.32	120.22	112.92	107.35	107.27
Agricultural soils	984.21	836.27	830.17	775.2	768.67
Field burning of agricultural residues	1.00	0.69	0.56	0.46	0.44
Other	0.23	0.23	0.23	0.19	0.21
Total emissions from agriculture	*1127.76*	*957.41*	*943.88*	*883.19*	*876.58*

Source: *Eurostat* [2008].

In Europe, 88 percent of nitrous oxide emissions originated from agricultural soils, while 12 percent was the share of manure management in 2006.

Since detailed estimations for the emissions of nitrous oxide from agricultural sources are not available for the EU, estimations for the United States of America are presented. In the USA, 78 percent of emissions derived from agricultural soils and 21 percent from manure management in 2006. (See Table 3.) 22 percent of nitrous oxide was emitted because of the use of nitrogen fertilizers. Concerning the emissions from manure management, cattle livestock is responsible for the majority of emissions (20 percent of emissions originates from agricultural sources) (*Energy Information Administration* [2007]).

Table 3

Nitrous oxide emissions from agricultural sources in the USA, 1990–2006
(million metric tons in carbon dioxide equivalent)

Sources of emissions	1990.	1995.	2000.	2005.	2006.*
	year				
Biological fixation in crops	58.6	62.1	67.9	70.7	71.2
Nitrogen fertilizers	53.1	51.2	45.6	57.9	63.0
Crop residues	28.2	28.1	34.6	37.3	36.9
Other	4.5	4.8	4.9	4.9	5.0
Total direct emissions	*144.4*	*146.2*	*152.9*	*170.9*	*176.2*
Soil leaching	36.3	35.2	31.3	39.5	43.0
Atmospheric deposition	6.5	6.3	5.6	7.0	7.6
Total indirect emissions	*42.8*	*41.4*	*36.9*	*46.5*	*50.6*
Total agricultural soils	*187.1*	*187.7*	*189.8*	*217.4*	*226.7*
Cattle	57.5	61.1	57.4	56.4	56.8
Swine	1.5	1.6	1.6	1.7	1.7
Poultry	0.9	1.2	1.3	1.4	1.4
Horses	0.7	0.7	0.7	0.7	0.7
Sheep	1.0	0.8	0.6	0.5	0.5
Goats	0.3	0.3	0.2	0.4	0.5
Total solid waste of animals	*61.9*	*65.6*	*61.8*	*61.2*	*61.7*
Crop residue burning	0.5	0.5	0.6	0.6	0.6
Total agricultural sources	*249.5*	*253.7*	*252.2*	*279.2*	*289.1*

* Preliminary data.
Source: *Energy Information Administration* [2007].

1.1.4. Land use, land-use change and forestry (LULUCF)

The change in land use has a significant impact on the contribution of agriculture to climate change. The most important land use changes that affect the carbon dioxide emissions or captures are (*IPCC* [2000]):

– changes in forest and other woody biomass stocks including commercial management, harvest of industrial roundwood (logs) and fuelwood, production and use of wood commodities, and establishment and operation of forest plantations, as well as planting of trees in non-forest locations,

– conversion of forests and grasslands to pasture, cropland, or other managed uses,

– abandonment of croplands, pastures, plantation forests, or other managed lands that regrow into their prior natural grassland, or forest conditions,

– changes in soil carbon.

The major potential possibilities for reduction of greenhouse gas emissions by land-use change are as follows (*Schlamadinger et al.* [2007]):

– provision of renewable energy,

– substitution for more fossil carbon-intensive products,

– reduction of emissions of non-carbon dioxide gases (for example from agriculture),

– sequestration of carbon through enhancement of terrestrial C stocks,

– conservation of existing carbon stocks (for example through reduced deforestation, devegetation, forest degradation, and land degradation).

2. The contribution of agriculture to climate change

In this part, the driving forces and pressures of the contribution of agriculture to climate change are presented. It is followed by the analysis of the linkages between related indicators.

2.1. Driving forces

The driving forces of the contribution of agriculture to climate change are:

– volume of agricultural production (the output of agriculture),

– structure of agricultural production (the ratio of animal and crop production),

– land use, land-use change and forestry,

– size of livestock,

– use of fertilizers,

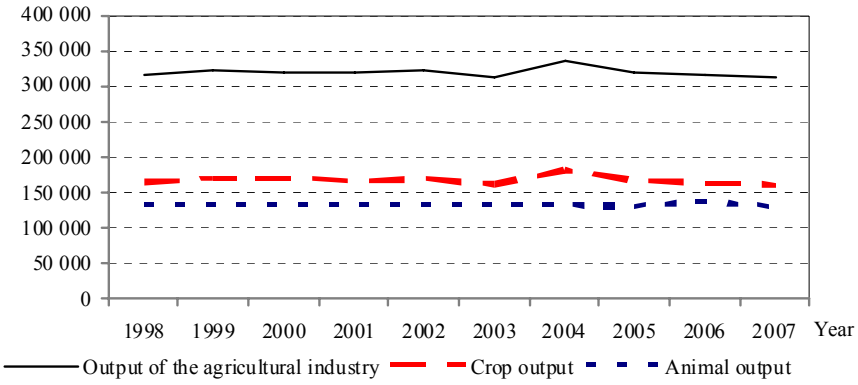
– use of fossil fuels and energy.

The production of crops and that of animals and animal products contribute to the climate change since they can be characterised by the combustion of fossil fuels, a major contributor to the global warming. As already mentioned, the major sources of greenhouse gases are the respiration of animals, the enteric fermentation of ruminant livestock and the management of manure in animal husbandry, and the use of fertilizers in crop production in the EU.

2.1.1. The output of agriculture

Figure 1 shows that neither the animal nor the crop outputs show significant changes at EU level in the last decade. The only change that can be detected is a peak in the crop output in 2004 because of the favourable weather for cereals in Europe in that year.

Figure 1. The output of agriculture at constant basic prices in the EU 27, 1998–2007
(EUR million)



Source: *Eurostat* [2008].

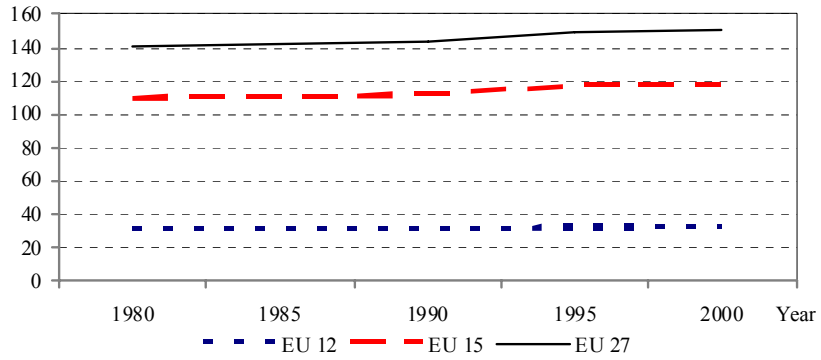
2.1.2. Land use, land-use change and forestry

The size of the utilized agricultural area does not show any significant change from 1980 to 2000 in Europe (*Eurostat* [2008]). In the EU 15[3], the size of the forest area increased by 8 percent from 1980 to 2000, while its growth was only 4 percent in the EU 12[4]. (See Figure 2.) The increment of the forest area in the EU 15 is the consequence of the EU policy for afforestation.

[3] EU 15 refers to Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

[4] EU 12 refers to Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia and Slovenia.

Figure 2. Total land under forest, 1980–2000
(million ha)

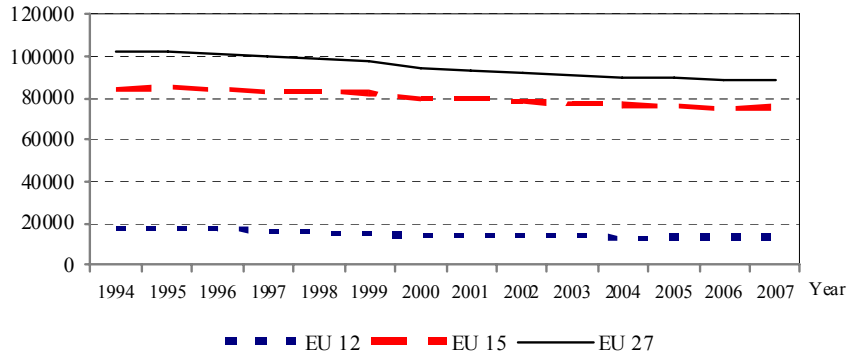


Source: *Eurostat* [2008].

2.1.3. Livestock

Livestock management (especially cattle livestock) is an important source of methane emissions and it partly contributes to the emissions of nitrous oxide, too. Enteric fermentation of ruminant livestock and manure management are major sources of greenhouse gas emissions. In the EU, the number of cattle livestock decreased by 13 percent from 1994 to 2007. (See Figure 3.)

*Figure 3. The size of cattle livestock, 1994–2007**
(thousand heads)



* Data of months of December.
Source: *Eurostat* [2008].

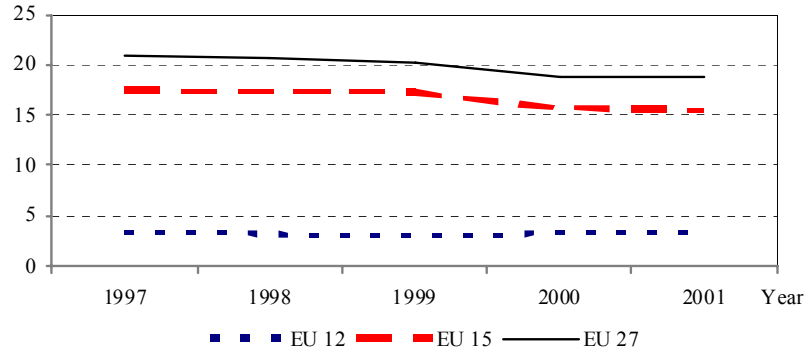
In the Central and Eastern European countries, there was also a significant drop in cattle livestock in the transition period of the early 1990s. From 1989 to 1995 the

livestock fell by 64 percent in Latvia, by 60 percent in Bulgaria, by 54 percent in Estonia, by 44 percent in Romania and by 42 percent in Hungary (*Eurostat* [2008]).

2.1.4. Fertilizer use

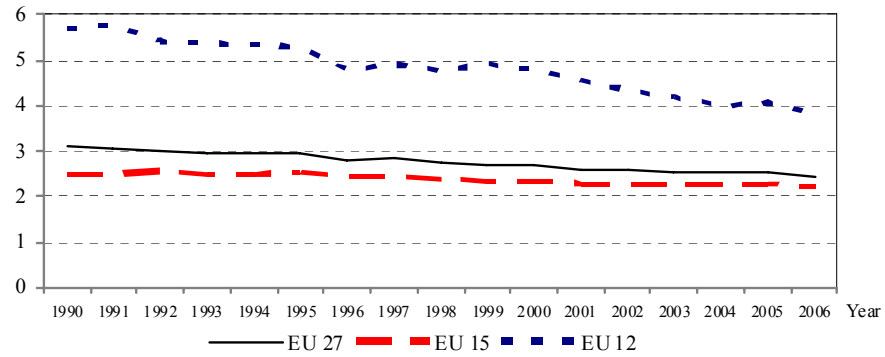
The use of nitrogen fertilizers is an important driving force of emissions of greenhouse gases. As a result, nitrous oxide is emitted to the environment. Data on fertilizer consumption in the EU, which are only available for the period of 1997–2001, show a ten percent decrease.[5] (See Figure 4.)

Figure 4. Fertilizer consumption, 1997–2001
(million metric tons of active ingredients)



Source: *Eurostat* [2008].

Figure 5. The ratio of agriculture in the total consumption of energy, 1990–2006
(percent)



Source: *Eurostat* [2008].

[5] The time series is short compared to the other data sets analyzed in this article. Therefore only limited analysis is possible.

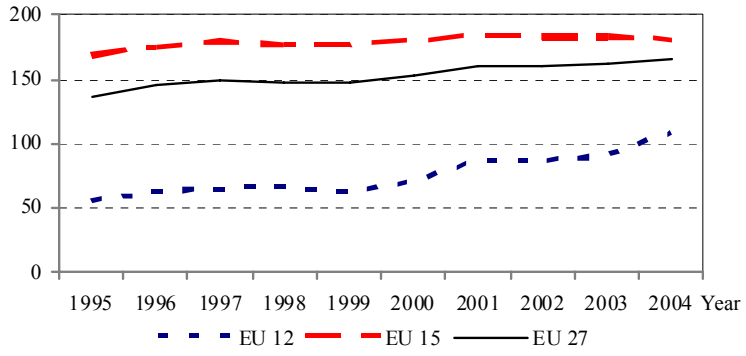
2.1.5. The use of fossil fuels

An important contributor to the climate change is the combustion of fossil fuels for heating and for the operation of machines used for agricultural production. The energy consumption of agriculture dropped by 45 percent in the new member states (EU 12) from 1990 to 2006, while it increased by 4 percent in the EU 15 in the same comparison. Compared to the total energy consumption of the economy, the ratio of agriculture decreased from 3.1 percent to 2.4 percent in the EU. (See Figure 5.)

Figure 6 describes the changes in energy efficiency of agriculture in the EU. In the new member states (EU 12), there was a considerable increase in energy efficiency from 1995 to 2004; though the gross value added (GVA) of agriculture per one unit of energy in the new member states still lags behind that of the EU 15. From 1995 to 2001, there was an increase in the energy efficiency in the EU 15, while a slight decrease can be detected between 2001 and 2004.

In addition to the energy consumption of agriculture, another aspect related to energy is the production of biofuels. Ethanol can be produced from maize or sugar cane, and biodiesel can be produced from plants that contain high amounts of vegetable oil. The production of biofuels is a controversial issue. On the one hand, biofuels are said to have an important role in the fight against greenhouse gas emissions, and they can have a favourable impact on fuel prices, on the other hand the support of fuel production against food production is debated. From the environmental point of view, further research is needed on the balance of greenhouse gas captures and emissions related to the production and use of crops for energy purposes.

Figure 6. Gross value added per unit of energy consumption, 1995–2004
(EUR thousand/terajoules)

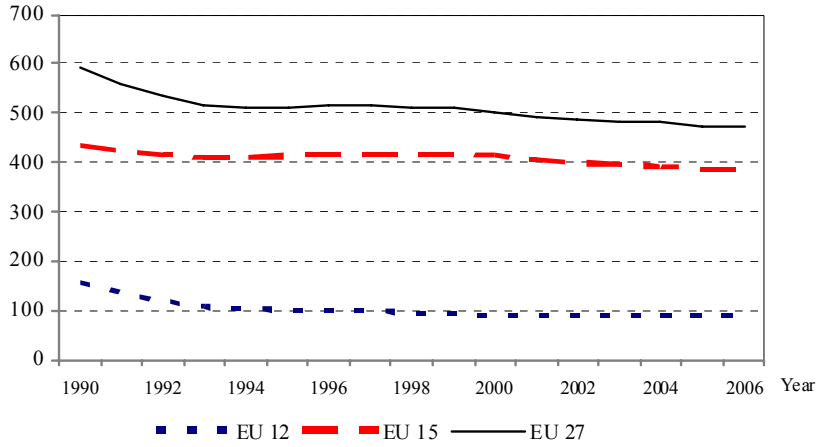


Source: *Eurostat* [2008].

2.2. Pressures – Emissions of greenhouse gases

The emissions of greenhouse gases – carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6) – have crucial impact on the climate (*UNFCCC* [2008]). The emissions from farms decreased by 44 percent in the new member states (EU 12), while it decreased by 11 percent in the EU 15 from 1990 to 2006. (See Figure 7.) Concerning EU 12, a sudden fall can be detected in the transition period due to the restructuring of agricultural production. The reason for this latter process is that radical political and economic changes occurred in the Central and Eastern European countries at the beginning of the 1990s, which led to a sharp economic decline. In the meanwhile, a new agricultural policy was initiated and a new, private ownership based agricultural structure was developed (*Fekete-Farkas et al.* [2008]).

Figure 7. Emissions of greenhouse gases in agriculture, 1990–2006
(thousand metric tons in carbon dioxide equivalent)



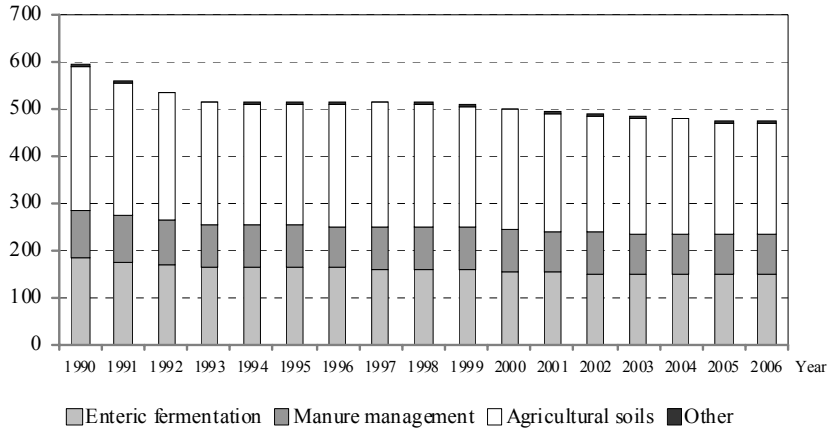
Source: *Eurostat* [2008].

Data on the source of emissions of greenhouse gases in agriculture are available in the database of Eurostat, though they do not cover the combustion of fossil fuels related to agriculture. Half of the emissions originate from the soil, mainly as a result of fertilizer use. 31 percent was the share of enteric fermentation of ruminant livestock, while 18 percent was that of manure management in 2006. In the EU member states, the emissions of greenhouse gases decreased by 20 percent from 1990 to 2006. (See Figure 8.)

The reason for the decrease of emissions from agricultural soil can be related to the fall of fertilizer use. In the EU, both figures show a 5 percent decrease from 1997

to 2001. The abatement of emissions from manure management and enteric fermentation can be related to diminishing ruminant livestock.

Figure 8. Emissions of greenhouse gases in agriculture of the EU by source of emissions, 1990–2006
(thousand metric tons in carbon dioxide equivalent)



Source: *Eurostat* [2008].

2.3. Analysis of the relation between driving forces and pressures in the EU

In order to present the relations among the different indicators, the correlations of selected indicators of the environmental and economic dimension related to climate change were calculated as a first step in the research. Each indicator was expressed as per unit of agricultural area, thus the obvious correlating factors (for example the size of the country) could be eliminated. Data of the EU 27 countries for the year 2000 were used for calculations. (See Table 4.)

A large correlation was detected in the case of the relation between the gross value added of agriculture and the use of energy by agriculture. The energy efficiency of agriculture does not show significant differences within the EU member states.

The relation between the use of fertilizers and the emissions of nitrous oxide seems to be significant, which may be the result of the estimation method used for the calculation of emissions of nitrous oxide.

The gross value added and the emissions of greenhouse gases also show a large correlation in Europe for the year 2000. According to this result, the "green efficiency" of agricultural production is similar in the EU member states.

Table 4

The correlation of selected indicators for the EU 27, 2000

Indicators examined	Correlation index
Use of energy in agriculture / agricultural area – gross value added of agriculture / agricultural area	0.90
Use of fertilizers / agricultural area – emissions of nitrous oxide / agricultural area	0.89
Gross value added of agriculture / agricultural area – emissions of greenhouse gases / agricultural area	0.87
Use of energy in agriculture / agricultural area – emissions of greenhouse gases / agricultural area	0.72
Use of fertilizers / agricultural area – crop output / agricultural area	0.45

Source: The author's own calculations.

The correlation between energy consumption and emissions of greenhouse gases is large. The reason why this correlation index is still large but slightly weaker than the former ones can be that besides the use of fossil fuels there are also other factors affecting the emissions of greenhouse gases (the use of fertilizers, the size of livestock, etc).

The correlation is medium in the case of fertilizer use and crop output. The medium correlation can be explained by dissimilarities in the structure of crop products and the difference in the fertilizer demand of crop species, the differing climatic and soil conditions in the member states, price differences, etc. Further research should be devoted to this area.

3. Conclusion

According to data presented in the paper, relative decoupling characterizes the European agriculture. While the output of agriculture did not change significantly over the last decade, the area of forests increased; the use of fertilizers, the relative and absolute use of energy, the cattle livestock and, as a result of all these, the emissions of greenhouse gases decreased.

Given the importance of climate change, priority should be placed on the related indicators. Reliable data on the driving forces and pressures of climate change will

enable us to make temporal and spatial comparisons, thus the policy makers can develop proper strategies for the mitigation of agricultural production.

References

BÁLINT, O. (ed.) [2006]: *A nemzetgazdasági ágak környezetszennyezése – légszennyezés*, 2000–2004. Központi Statisztikai Hivatal. Budapest.

BRUNTLAND, G. (ed.) [1987]: *Our Common Future: The World Commission on Environment and Development*. Oxford University Press. Oxford.

COUNCIL OF THE EUROPEAN UNION [2006]: *Review of the EU Sustainable Development Strategy (EU SDS) – Renewed Strategy*. Brussels.

ECCP [2008]: *Second European Climate Change Programme (ECCP II)* (2005-) http://ec.europa.eu/environment/climat/eccp.htm

ENERGY INFORMATION ADMINISTRATION [2007]: *Emissions of Greenhouse Gases Report*. http://www.eia.doe.gov/oiaf/1605/ggrpt/

EUROSTAT [2008]: Statistical Database of Eurostat. *http://epp.eurostat.ec.europa.eu /portal/page?_pageid=1090,30070682,1090_33076576&_dad=portal&_schema=PORTAL*

FEKETE-FARKAS, M. – MOLNÁR, J. – SZŰCS, I. [2004]: *Fenntartható fejlődés és mérési lehetőségei a mezőgazdaságban.* WEU Nemzetközi Konferencia. NYME MÉK. Mosonmagyaróvár. Working paper.

FEKETE-FARKAS, M. – SINGH, M. K. [2008]: *Main Drivers of Land Use Changes in Central and Eastern European Countries*. Fourth International Conference on Business Management and Economics. Cesme. Working paper.

FEKETE-FARKAS, M. ET AL. [2007]: Sustainable Growth and its Measurement in Agriculture. In: *Perspectives on Economics Volume 1: Selected Proceedings of the Third International conference on Business, Management and Economics*. Yasar University. Cesme-Izmir. pp. 267–284.

IPCC [2000]: *Land Use, Land-Use Change and Forestry: A Special Report of the IPCC*. Cambridge University Press. Cambridge.

IPCC [2007]: Summary for Policymakers. In: *Solomon, S. et al.* (eds.): *Climate Change 2007: The Physical Science Basis.* Cambridge University Press. Cambridge, New York.

KIRCHMANN, H. – THORVALDSSON, G. [2000]: Challenging Targets for Future Agriculture. *European Journal of Agronomy*. Vol. 12. No. 3–4. pp. 145–161.

OECD [2002]: *Indicators to Measure Decoupling of Environmental Pressure from Economic Growth*. OECD. Paris.

SCHLAMADINGER, B. ET AL. [2007]: A Synopsis of Land Use, Land-use Change and Forestry (LULUCF) under the Kyoto Protocol and Marrakech Accords. *Environmental Science & Policy*. Vol. 10. No. 4. pp. 271–282.

TRENBERTH, K. E. ET AL. [2007]: Observations: Surface and Atmospheric Climate Change. In: *Solomon, S. et al.* (eds.): *Climate Change 2007: The Physical Science Basis.* Cambridge University Press. Cambridge, New York.

UN [2005]: *2005 World Summit Outcome*. Working document of the United Nations General Assembly.

UNFCCC [2008]: *Targets of Kyoto Protocol*. http://unfccc.int/kyoto_protocol/items/3145.php

VALKÓ, G. – FEKETE-FARKAS, M. [2007]: *The Measurement of Sustainability in Agriculture*. EAAE Ph.D. Workshop 2007. Rennes. Working paper.

VALKÓ, G. – FEKETE-FARKAS, M. [2008]: *Indicators of Sustainable Agriculture with Special Attention to Those of Climate Change.* International Conference on Social Sciences. Izmir. Working paper.

Integrated Database of International Migration Statistics with a Particular Attention to Linking Data Sources

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International migration statistics use several administrative data sources, among those the registers of foreigners handled by the Office of Immigration and Nationality, and the register of personal data and addresses of the Central Office for Administrative and Electronic Public Services. Since 2002, these data sources have been complemented by an extensive survey on people who acquired Hungarian citizenship.

In the current study the procedure of linking the databases into a single integrated system will be reviewed.

KEYWORDS:
International migration.
Data processing.

The users' needs for quick and quality statistical data on different aspects of the economy and society impose a permanent demand for new efficacious methods of data collection on the statistical authorities. Utilization of administrative records may result in quicker statistics with low costs and high quality.

The present paper deals with the combined use of data of registers and surveys for international migration statistics at the Hungarian Central Statistical Office (HCSO).

Following a long period of isolation, migration has become a process affecting the Hungarian society in the last third of the 1980s. The situation changed fundamentally at the end of the decade. The historic events created a situation in which Hungary became a transit country to the West, as well as a final destination for immigrants (*Juhász* [2003]).

The need for an established information system on international migration came up at different levels of decision-making, public administration and civil society at the beginning of the 1990s. The HCSO started to compile the international migration statistics in 1992, using the administrative databases containing related information. The regular publication of migration statistics began in 1993.

The first major applied data sources were the population register and the central alien register. These administrative datasets were among the very first ones available for the statistics at the individual level. Later on these data sources were augmented with data on foreigners having work permit and on refugees. Recently the data of the national health insurance and those of the tax authority were included as well in order to obtain more complex information on the foreign population living or working in Hungary.

As there was an increasing need for having more information on new Hungarian citizens, a complementary statistical data collection was introduced in 2002. It contains information on demographic characteristics, previous citizenship, economic activity, occupation and the main reason for applying for the Hungarian citizenship.

Beyond the domestic needs, the statistics have to take the requirements of international organisations (UN, OECD) and the EU into consideration. Following a long period of gentlemen's agreements on the community migration statistics, the Regulation (EC) No 862/2007 of the European Parliament and of the Council has been issued recently saying "Harmonised and comparable Community statistics on migration and asylum are essential for the development and monitoring of Community legislation and policies relating to immigration and asylum, and to the free movement of persons".

In Hungary, the Act on Statistics (XLVI of 1993) guarantees that the HCSO has a right to use and link the official administrative data sources for statistical purposes. Furthermore, the acts establishing the migration-related administrative registers allow the HCSO the utilization of the data as well, mostly at an individual level.

1. Statistical concepts and areas

The basic definitions used in the Hungarian international migration statistics are in accordance with those of the United Nations Recommendations on Statistics of International Migration that are applied by the Regulation (EC) No 862/2007 of the European Parliament and of the Council too.

The most important concepts used in the present description are as follows:

Immigration and immigrant. According to the previously mentioned regulation, immigration in the present sense means the action by which a person establishes his or her usual residence in the territory of Hungary for a period that is, or is expected to be, of at least twelve months, having previously been usually resident in another country. Immigrant means a person undertaking immigration. In the Hungarian practice a foreigner having a residence permit for a longer stay or an immigration permit, who spent at least one year in Hungary after entering or got a residence permit for more than one year, is considered an immigrant.

Residence permit. At the request of a foreign citizen staying in Hungary with a valid residence visa, the local directorate of the immigration office issues a residence permit in order to lengthen the period of staying.

On 1st January 2002, the differentiation between the long-term (at least 1 year) and temporary (less than 1 year) residence permits was cancelled.

Permanent residence permits

1. Immigration permit (before 1st January 2002): A foreign citizen might have been given an immigration permit if he or she had been staying in Hungary for at least 3 years continuously and their accommodation and livelihood were secured and there was no excluding reason according to the laws.

2. Settlement permit (after 1st January 2002) /*National or EC permanent residence permit* (since 1st July 2007):[1] According to the revisions of the Alien Act, immigration permit was replaced by settlement

[1] Act I & II of 2007.

permit on 1st January 2002 and by national permanent residence permit on 1st July 2007. A permanent residence permit may be granted to a foreign citizen if he or she has lawfully resided in the territory of the Republic of Hungary continuously for at least the preceding three years before the application is submitted, except the case when the reason of stay is studying.

According to the national needs and international recommendations the Hungarian migration statistics of a given year cover the following main areas:

a) flows of immigrants and emigrants,
  – foreigners
  – Hungarians
b) stock of foreign migrants in Hungary,
c) naturalized population,
d) work permits,
e) refugees and asylum seekers.

2. Data sources

Migration statistics are primarily based on two administrative data sources: the population register and the central alien register (databases of the Office of Immigration and Nationality). These datasets are linked for providing knowledge on the stocks and flows of migrants, both foreigners and Hungarians, and the naturalized population. Separately, two other data sources supply statistical information on refugees and asylum seekers, as well as foreigners having work permit in Hungary.

In the following description, the population register, the central alien database and a statistical full-coverage survey of new citizens will be discussed in detail, whilst these data sources can be considered as an integrated solid data set.

2.1. Central Alien Register

Foreigners are registered in the Central Alien Register (CAR). The Office of Immigration and Nationality is responsible for this database (*THESIM report* [2005]). All foreigners applying for or holding a visa, a residence permit, an immigration permit or a residence permit and their accompanying children are included.

On the basis of the CAR, statistics are produced for

– foreign migrants staying in Hungary, 1st January,
– foreign migrants entering or leaving the country in the given calendar year,
– those having a valid permit for staying in Hungary as immigrants in the given calendar year.

On 1st January 2002, a new act was issued that amended the rules of immigration, and on 15th February 2002 a new register was opened. The cases are maintained in the old register, but every new case is included in the new one. On 1st January 2007, a separate register was established for the citizens of EEA (European Economic Area) countries.

Data entries: name, mother's name, date, place and country of birth, sex, citizenship, family status, educational attainment, occupation, addresses and date of entry.

2.2. Register of personal data and addresses (Population Register)

The major purpose of establishing the population register was providing reliable information on the names and addresses of the population for elections and referendums. It contains the most important data for identifying persons and separating different groups.

The Hungarian population register includes information on the following categories:

– Hungarian citizens having permanent residence (domicile) in Hungary,
– Hungarian citizens having permanent residence abroad (living abroad or living temporarily in Hungary) upon their request,
– foreigners with permits for permanent residence (including recognised refugees and stateless people),
– EEA citizens with residence permit.

Foreigners staying in Hungary temporarily (for example foreigners with a residence visa or a "temporary" residence permit, foreigners with a certificate entitling to temporary stay, foreign diplomats and asylum seekers) and the overwhelming majority of the Hungarian citizens staying temporary abroad are not included because they abstain from reporting that they leave the country. Moreover, the population register covers very limited information on individuals, not even allowing us to ex-

plore the basic characteristics of the migrant population. This is the reason why the Hungarian migration statistics are based on several administrative and statistical data sources and the population register is only one of them.

The information included in the population register is the following: name, mother's name, date and place of birth, country of birth, sex, citizenship, address(es), date of registration, date of log out of the register, cause of registration, cause of log-out, family status, and date of acquisition of the Hungarian citizenship.

2.3. Statistical survey on people who acquired Hungarian citizenship

After getting the citizenship, all new Hungarian citizens are asked to fill in statistical forms on themselves and on their minor children who acquired the Hungarian citizenship together with them. Filling in the questionnaire is voluntary. The respondents are asked to provide information on personal data (name, mother's name, date of birth, place of birth, country of birth, address), on demographic characteristics such as sex, family status, number of children, and on mother tongue, previous citizenship, educational attainment, reason of application, economic activity and occupation before entering Hungary and currently, on the date of the acquisition of the Hungarian citizenship. The questionnaires are distributed to and upon completion collected from the local governments by the HCSO.

3. Control and data editing

The controlling and data editing processes differ in the case of the Central Alien Register, the Population Register and the statistical survey on people who acquired Hungarian citizenship.

3.1. Central Alien Register

The data editing process in the case of the Central Alien Register has six main steps:

1. The Central Alien Register is a complex dataset containing records of each measure made in reference to a person. Combining data of records belonging to the same person, a new record of the necessary data must be produced. In order to merge the different records of a given person, a key variable (based on the main identifying variables such as the name and the date of birth) shall be used.

2. The register includes three sub-registers in accordance with (the changes of) the legal rules:

– Register of foreigners registered by the immigration authority before 15th February 2002,

– Register of EEA-citizens,

– Register of third-country nationals.

However, these sub-registers use different coding rules for certain common variables. Since the statistical use necessitates a single code list for a variable, the original different code lists are converted into the one used by the statistics.

3. Foreigners with permanent residence permits are included in the Population Register as well. In the case of the common variables, the missing or out-of-date information in the Central Alien Register can be substituted by that of the Population Register. To achieve this, the two datasets are merged using a record linkage technique.

4. Whenever it is possible, standard classifications (such as International Standard Classification of Occupations, ISCO) are used instead of the register's own classifications.

5. Automatic corrections make the different dates relating to one person coherent. Furthermore, information on educational attainment, occupation, family status and age is also harmonized.

6. According to the data describing the present status (type of permit, duration of stay in the country, date of entry) of the foreign person, statistically relevant groups of migrants are formed.

3.2. Population Register

Only the completeness of the records selected for the purposes of international migration statistics is checked. It is investigated whether the number of records in the various groups of the foreign population fits to that of the previous years, taking into account the information of other data sources.

3.3. Statistical survey on people who acquired Hungarian citizenship

Control and editing of survey data consist of four steps:

1. Checking if all completed questionnaires have been received by the HCSO. In 2002, when the statistical survey was introduced, almost

three fourth of the new Hungarian citizens filled in the statistical form (*Kincses* [2003]). It may be considered quite a good proportion taking into account that answering is voluntary. In the following years the response rate was even somewhat higher.

2. Check of the validity of code numbers and the logical consistency of answers. In the case of mistakes, correction is made using the available information. The response rate of the individual questions is rather high. It is the lowest as regards the educational attainment, where it almost reached 90 percent.

3. The survey data are compared with the data of the registers concerning the naturalised people in order to control whether the two datasets can be statistically considered the ones provided by the same population.

4. The survey data are integrated with the related records in the population register using a statistical technique.

3.4. Linking techniques

The datasets are linked using two approaches: a record level- and a statistical linkage.

Record level linkage of the Central Alien Register with the Population Register

The two administrative databases are integrated with a one-to-one record linkage technique. This data linkage serves two aims related to the common variables of the two registers for foreigners having permanent residence permit. One of the purposes is to update the variables in the immigration register and the other is – in case of deficiency, mistake or inconsistency – to correct them, using data of the population register, which is based on registrar's reports.

A key variable is constructed by merging the family name, the given name and the date of birth. In order to have an unambiguous personal identification code, the names are curtailed of accents. In the first step, the records of the two datasets having the same key variable are linked to each other in an automatic matching process. Finding the pairs in the rest of the cases is done manually using further information if necessary.

Statistical linkage of the Population Register with the statistical survey

The combination of the administrative data with the survey data is divided into two parts. First, it is checked whether the two data sources provide information on

the same population neglecting the acceptable errors of the statistical survey. Secondly, a statistical data linkage is carried out.

As a preparatory action the closeness and stability of the relationship between the two databases are measured with two statistics.

a) The linear correlation coefficient is as follows:

$r_{xy} = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^{n}(x_i - \bar{x})^2 \sum_{i=1}^{n}(y_i - \bar{y})^2}}$, where x_i, and y_i are the values of the variables in the two data sources, while $\bar{x}$, and $\bar{y}$ are the related means and $-1 < r_{xy} < +1$.

b) The elasticity coefficient is as follows:

$E = \frac{\sum_{i=1}^{n}(x_i - \bar{x})(y_i - \bar{y})}{\sum_{i=1}^{n}(x_i - \bar{x})^2} \frac{\bar{x}}{\bar{y}}$. It indicates how much change of the variable *y* is caused by 1 percent change of the variable *x* in the given relationship (*Hunyadi – Vita* [2004]).

Three common variables are used for the comparison: previous citizenship, county of the place of residence and age. These variables are rather different with respect to the number of categories and the coverage ratio of the individual groups.

1. In the case of previous citizenship only the European countries are considered due to the low number of cases outside Europe and to their lower reliability. The following five categories are used for citizenship: Romania, countries of former Yugoslavia, Ukraine, other EU member countries and, the rest of Europe.

On the basis of both coefficients the two datasets are proved to be highly consistent.[2]

2. Considering the frequencies by the county of the place of residence, the ratio of the register cases covered by survey records is very different by counties (20 including the capital). It might be explained by the increased mobility of the migrant population that they declare

[2] The coefficients for 2002 were as follows: $r_{xy} = 0.9971$ and $E = 1.11$.

the official address in the register, but in the survey they indicate the actual address or the one where they plan to move soon. The coefficients show somewhat less correspondence than those of citizenship.[3]

3. Looking at the differences of the two datasets by the distribution among the eight age groups (0–14, 15–19, 20–24, 25–29, 30–39, 40–49, 50–59, 60–X years), it can be stated that the coverage ratio is the lowest for the 0–14 year old children. The questionnaire is filled in for less than half of the children in the register. It is due to the fact that the parents are less willing to fill in the form for their children than for themselves. The closeness of the relationship in this case was the lowest.[4]

Based on the foregoing, the two datasets are not independent. We might suppose that the records of the two data sources relate to the same population. This checking procedure is repeated each year.

As the aim of the statistical integration is to produce two-dimensional frequency or contingency tables, there is no need for exact matching of the records of the two data sources. Furthermore, the statistical survey will never cover the 100 percent of the cases included in the register that hinders the implementation of a simple one-to-one record level integration. It seems reasonable to use the RAS method for linking the two data sets rather than apply a record linkage (*Stoyan–Takó* [1993]; *Kincses* [2003], [2004]).

Let us consider a two-dimensional table of the statistical survey. One of the variables is common in the two data sources. It can be supposed that the variable of the column is the common one, while that of the row is included only in the data set of the statistical survey. The elements of the table are as follows:

$$\begin{array}{cccccc|c} a_{11} & a_{12} & . & . & a_{1n} & a_{1.} \\ a_{21} & . & . & . & a_{2n} & a_{2.} \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ . & . & . & . & . & . \\ a_{m1} & a_{m2} & . & . & a_{mn} & a_{m.} \\ \hline a_{.1} & a_{.2} & a_{.3} & . & a_{.n} & a \end{array}$$

[3] Although the proportions varied between 42 percent and 100 percent in 2002, the coefficients showed close relationship, r_{xy} = 0.9851 and E = 0.9278.

[4] In 2002, the average age was 37.93 years in the register and 40.58 in the statistical survey, r_{xy} = 0.9503 and E = 0.8927.

a_{ij} denotes the element in the cross of the row *i* and the column *j*.

$a_{.j} = \sum_{k=1}^{m} a_{kj}$, for any $j \in \{1,2,.....,n\}$, and $a_{i.} = \sum_{l=1}^{n} a_{il}$ for any $i \in \{1,2,.....,m\}$,

and $a = \sum_{b=1}^{m} \sum_{c=1}^{n} a_{bc}$.

The RAS method modifies the elements of the previously mentioned table in a way that the inner distributions will remain the same and the table will fit to the register data too.

As the first step, the column values will be changed to the ones in the register. The new values will be denoted as $b_{.j}$ (*j* = 1,2,….,*n*) and the grand total will be *b*.

.....	.	.	.	.	.
.....	.	.	.	.	.
.....	.	.	.	.	.
.....	.	.	.	.	.
.....	.	.	.	.	.
.....	.	.	.	.	.
$b_{.1}$	$b_{.2}$	$b_{.3}$	.	$b_{.n}$	b

Let us change a_{ij} to a'_{ij} so that the column sums will remain and the change of the elements will be proportionate. Thus, the new elements will be as follows:

$a'_{ij} = \frac{b_{.j}}{a_{.j}} \cdot a_{ij}$ for any $i \in \{1,2,.....,m\}$, and any $j \in \{1,2,.....,n\}$, and they fulfil the following equation: $\sum_{i=1}^{m} a'_{ij} = \sum_{i=1}^{m} \frac{b_{.j}}{a_{.j}} \cdot a_{ij} = \frac{b_{.j}}{a_{.j}} \sum_{i=1}^{m} a_{ij} = \frac{b_{.j}}{a_{.j}} \cdot a_{.j} = b_{.j}$. This means that the column sums are as expected and the inner elements are proportionate.

The row sums will be as follows:

$b_{i.} = \sum_{j=1}^{n} a'_{ij} = \sum_{j=1}^{n} \frac{b_{.j}}{a_{.j}} \cdot a_{ij}$ for any $i \in \{1,2,.....,m\}$, and any $j \in \{1,2,.....,n\}$,

The sum of the totals equals to the value of the grand total:

$$\sum_{i=1}^{m} b_{i.} = \sum_{i=1}^{m}\sum_{j=1}^{n} \frac{b_{.j}}{a_{.j}} \cdot a_{ij} = \sum_{j=1}^{n} \frac{b_{.j}}{a_{.j}} \left(\sum_{i=1}^{m} a_{ij}\right) = \sum_{j=1}^{n} \frac{b_{.j}}{a_{.j}} \cdot a_{.j} = \sum_{j=1}^{n} b_{.j} = b\,.$$

In the way described previously a projection was carried out that keeps the inner relationships invariant combining the pieces of information of administrative and statistical data sources.

4. Summary and conclusions

In the recent period not only the statistical use of the administrative data sources but also their integration has been coming to the front. It is caused by the increasing demand for quick and cost-effective data collection methods that decrease the burden of data providers, and by rising awareness of the potential benefits to be gained through matching disparate databases.

Migration statistics is one of the domains, which must rely on administrative data sources. Migration policy should be based on an information system comprising data on immigrants and their integration in many aspects. Such a dataset shall be the result of merging a number of separate registers and statistical surveys. In order to link them, a unified set of identification data should be used. The demand is very similar to the one of a register based census that has become more frequent in the world.

The better accessibility of administrative data, the more frequent use of them and the closer co-operation among the stakeholders will contribute to a unified system of migration data of high quality.

References

OFFICE JOURNAL OF THE EUROPEAN UNION [2007]: *Regulation (EC) No 862/2007 of the European Parliament and of the Council of 11 July 2007 on Community Statistics on Migration and International Protection*. Vol. 50. L 199. pp. 23–29. http://eur-lex.europa.eu.

HUNYADI, L. – VITA, L. [2004]: *Statisztika közgazdászoknak*. KSH. Budapest.

JUHÁSZ, J. [2003]: Data System Description-Hungary. Compstat. www.compstat.org

KINCSES, Á. [2003]: *A magyar állampolgárság megszerzésének statisztikájához tartozó adatforrások leírása.* Working Paper.

KINCSES, Á. [2004]: *A magyar állampolgárság megszerzése, 2002–2003*. KSH. Budapest.
STOYAN, G. – TAKÓ, G. [1993]: *Numerikus módszerek 1*. Typotex Kiadó. Budapest.
THESIM REPORT, HUNGARY [2005]: www.cefmr.pan.pl/docs/thesim_report_hu.pdf
www.ksh.hu

Foreign Retired Migrants in Hungary*

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The paper examines international retirement migration (hereafter IRM) with particular attention to the newly emerging forms. On the basis of IRM statistics on Hungary, we drew up the motivational system of the twelve most important sending countries. Our main aim was to produce research results embedded into the contemporary conceptual framework. We analysed register based comparable data from the Hungarian Central Statistical Office between 1996 and 2008. In the interest of developing a valuable international migration policy in Hungary, we identified seven different motivational types (family oriented, work-driven, return, amenity seeking, crisis-led, ethnic related and higher pension hunting) from which two can be considered as gain generating forms (amenity seeking and return) and one (higher pension hunting) as a less beneficial kind for the receiving country. The paper concludes with recommendations for the Hungarian policy makers to remove legal impediments to the effective way of retirement migration without creating tensions among countries.

KEYWORDS:
International migration.
Retirement.
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The recent literature "echoes" the multiple motivational system of international elderly migration (*Attias-Donfut–Wolff* [2005], *Oliver* [2007], *Brown–Glasgow* [2008]). We can foretell that all of the relevant sciences could provide a different classification by their own logic (*Ainsaar* [2004]). Moreover, the taxonomy of IRM related to Hungary could be also created from various points of view (*Meyer–Speare* [1985], *Frey–Liaw–Lin* [2000], *Withol de Wenden* [2001]).

Previous studies identified the main causes of IRM and defined some of its types (*Wiseman–Roseman* [1979], *Cribier* [1974], *Warnes* [2002]). In their pioneer study, *Wiseman* and *Roseman* [1979] separated three groups of retirement migration: kinship migration, return to place of origin and looking for amenity. The same reasons were identified in *Cribier*'s [1974] study: family re-unification, return to the area of origin and search for places with high amenity values. *Litwak* and *Longino*'s [1987] development model of later life stressed the role of time. They associated the three successive phases of elderly migration with typical residential requirements and thus, with migration decisions based on special motivations. In the first phase, the early retirement process, the rapid ageing and the wish for a better life (environmental and amenity considerations) prevail. The second takes place when frailty or ill-health begins, which creates a demand for services and support. In this phase the elderly are still – more or less – able to find cheaper residing solutions. The third stage of migration is marked by dependency, when a person is unable to live independently. *Karen O'Reilly*'s [1995] time perspective differed from Litwak and Longino's life course aspect. She underlined the time spent in the areas of origin and destination and proposed a five-fold typology: expatriates, residents, seasonal visitors, returners and tourists. *King*'s [2002] paper added another new factor, namely the crisis related migration (forced and impelled), to the list mentioned previously. Forced migration refers to cases, when individuals involved do not have power to decide. In the case of impelled migration, migrants play some role in the decision making process.

Warnes et al. [2004] presented a specific typology of the welfare position of international elderly migrants in contemporary European context. However, this most recent study was not able to form new types of IRM. *Warnes* ([2002] p. 140.) pointed out that the family oriented, the place-of-origin led, the amenity seeking and the working life related factors were crucial for later life migration. Thus, attention should be given not only to the popular or the maybe most significant types but also to the others for an in-depth understanding of the patterns of elderly migration.

1. Selection of IRM types relevant to Hungary

According to the empirical results of the 2003 survey on the Upper Balaton region (*Illés* [2007]) and the relevant literature highlighted previously, we can distinguish seven different motivation groups fitting into the Hungarian context: family oriented, work-driven, return, amenity seeking, crises-led, ethnic related, and higher pension hunting types. This typology is useful to judge the distinct impacts of each migration form on the country of destination. After classification, we weighted the types and aggregated the core elements of the typologies in a coherent motivational system by which a comprehensive basis was provided for international comparison.

Table 1

Immigrants staying in Hungary
by age group and country of citizenship, 1 January 2008
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	4 378	53 732	7 726	*65 836*
Ukraine	1 173	13 860	2 256	*17 289*
Germany	436	9 252	4 748	*14 436*
Serbia	1 427	12 988	2 771	*17 186*
Bulgaria	52	631	445	*1 128*
Russia	227	2 073	487	*2 787*
Poland	82	2 184	379	*2 645*
USA	336	1 653	354	*2 343*
Austria	134	1 488	949	*2 571*
Croatia	73	660	119	*852*
Switzerland	15	260	312	*587*
Slovakia	280	4 547	117	*4 944*
Total of the former twelve countries	*8 613*	*103 328*	*20 663*	*132 604*
Rest of Europe	1 295	11 996	2 593	*15 884*
Europe (including Russia)	*9 572*	*113 671*	*22 902*	*146 145*
Rest of the World (including USA)	4 206	23 041	1 305	*28 552*
Total	*13 778*	*136 712*	*24 207*	*174 697*

Source: Demographic Database of the Hungarian Central Statistical Office.

The "*higher pension hunting*" type seems unusual at first, though a great number of retired immigrants from Romania and Ukraine fall into this category. On 1st January 2008, 7 726 international elderly immigrants from Romania, 2 256 later-life immigrants from Ukraine and 487 old people with immigrant status from distant Russia stayed in Hungary. (See Table 1.) In contrast, there were only 117 immigrants of retirement age living in Hungary from neighbouring Slovakia, which has a significant ethnic Hungarian population along the common frontier. The number of Ukrainian and Russian people, who are residents in our country, have doubled and quadrupled since 1996. These are the two countries besides Romania with which Hungary has had valid and functioning bilateral social political agreements deriving from a territorial principle since the early 1960s (*Lukács* [2000]). In the case of these latter states, the amount of the pension is calculated by the pension/social insurance organisation of that country, where the beneficiary's permanent address can be found, adding together the years of service performed in both countries. There is no burden sharing, consequently the state pension is paid only by one of the affected countries. Thus, pensioners from Romania (this possibility ceased on the day of EU accession of Romania (1st January 2007) due to the harmonization of Community legislation), Ukraine and Russia had made a rational decision based upon self-interest when they immigrated to Hungary as the Hungarian regulations granted them higher amounts of pension than they would have or could have got in their country of origin (*Illés* [2006]). In other words, the higher pension was probably a significant motivation factor for them.

Family-connected immigration includes the types of family formation and family reunification, as well as the "closer to the relatives" moves. The most probable reason for the immigration of old persons is their intention to join their families arrived from the East. More specifically, the previously immigrated offsprings proceed to "import" their parents as well, as soon as the period necessary for their minimum degree of integration elapsed. The dominance of the family orientation as a motivation factor is confirmed by the fact, that the share of the sixty-and-over age group by country of origin was very similar to that of children of under fourteen within the total number of immigrants in 2008. (See Table 2.) The relevant proportions for some of the countries are as follows: Romania 31.9 percent, 31.8 percent; Ukraine 9.3 percent, 8.5 percent; Serbia 11.4 percent, 10.4 percent; Russia 2.0 percent, 1.6 percent, and Croatia 0.5 percent, 0.5 percent. Therefore we can conclude that not only the elderlies but also children followed the active immigrants. Although we cannot be sure whether they live together or separately, yet we can talk about family migration.

Table 2

Proportion of immigrants staying in Hungary by country of citizenship and age-group, 1 January 2008
(percent)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	31.8	39.3	31.9	*37.7*
Ukraine	8.5	10.1	9.3	*9.9*
Germany	3.2	6.8	19.6	*8.3*
Serbia	10.4	9.5	11.4	*9.8*
Bulgaria	0.4	0.5	1.8	*0.6*
Russia	1.6	1.5	2.0	*1.6*
Poland	0.6	1.6	1.6	*1.5*
USA	2.4	1.2	1.5	*1.3*
Austria	1.0	1.1	3.9	*1.5*
Croatia	0.5	0.5	0.5	*0.5*
Switzerland	0.1	0.2	1.3	*0.3*
Slovakia	2.0	3.3	0.5	*2.8*
Total of the former twelve countries	*62.5*	*75.6*	*85.4*	*75.9*
Rest of Europe	9.4	8.8	10.7	*9.1*
Europe (including Russia)	*69.5*	*83.1*	*94.6*	*83.7*
Rest of the World (including USA)	30.5	16.9	5.4	*16.3*
Total	*100.0*	*100.0*	*100..0*	*100.0*

Source: The authors' own calculation.

Table 3

Proportion of immigrants staying in Hungary by country of citizenship and age-group, 1 January 2008
(percent)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	6.6	81.6	11.7	*100.0*
Ukraine	6.8	80.2	13.0	*100.0*
Germany	3.0	64.1	32.9	*100.0*
Serbia	8.3	75.6	16.1	*100.0*
Bulgaria	4.6	55.9	39.5	*100.0*
Russia	8.1	74.4	17.5	*100.0*
Poland	3.1	82.6	14.3	*100.0*
USA	14.3	70.6	15.1	*100.0*
Austria	5.2	57.9	36.9	*100.0*

(Continued on the next page.)

(Continuation.)

Country	Age group			
	0–14	15–59	60–X	*Total*
Croatia	8.6	77.5	14.0	*100.0*
Switzerland	2.6	44.3	53.2	*100.0*
Slovakia	5.7	92.0	2.4	*100.0*
Total of the former twelve countries	*6.5*	*77.9*	*15.6*	*100.0*
Rest of Europe	8.2	75.5	16.3	*100.0*
Europe (including Russia)	*6.5*	*77.8*	*15.7*	*100.0*
Rest of the World (including USA)	14.7	80.7	4.6	*100.0*
Total	*7.9*	*78.3*	*13.9*	*100.0*

Source: The authors' own calculation.

The "Eastern-type" family reunification (parents followed their children) had only low probability in the case of elderly immigrants of German descent. 4 748 immigrants of sixty years or older from Germany, 949 from Austria and 312 from Switzerland stayed in Hungary at the beginning of 2008. (See Table 1.) After calculating the index of dissimilarity or discrepancy of generations (the index of the elderly is divided by the index of the non-elderly) by countries we received about 2.7 for Germans, 3.2 for Austrians, 6.1 for Swiss citizens and 3.5 for Bulgarians. (See Table 4.) These four greatest values reflect that family reunification plays a less important role in these cases. It is probably no coincidence that Germany, Austria and Switzerland are just the three countries with which Hungary signed EU-conform agreements on social security around the turn of the millennium. (The peculiar Bulgarian case is explained hereinafter.) Within their framework, the years of service performed both abroad and in Hungary can be aggregated, and it is also possible to transfer the benefits to the territory of the other contracting party in the case of immigration. The foregoing shows that people arriving from the West have their pensions transferred to our country and intend to own and maintain properties here (*Illés–Michalkó* [2008]). Since their consumption takes place in Hungary and they cover their health and social care expenses from their own resources (*Szőke* [2006]), they obviously generate benefits for the host country. Meanwhile, in the case of people arriving from the East, the cost of the Hungarian pension, the health and social insurance is not certainly counterbalanced by the imported capital, the potential consumption and activity, which serve mainly their own and their relatives' benefits. Thus, this latter situation does not seem nearly as positive as it does in the case of "Western arrivals" from the angle of the utilitarian international migration policy emerging in Hungary.

Table 4

Indices of immigrants staying in Hungary by country of citizenship, 1 January 2008

Country	Index of the elderly	Index of the non-elderly	Index of dissimilarity of generations
Romania	0.753	1.046	0.720
Ukraine	0.837	1.030	0.813
Germany	2.111	0.795	2.655
Serbia	1.035	0.994	1.041
Bulgaria	2.532	0.717	3.530
Russia	1.121	0.978	1.147
Poland	0.920	1.015	0.906
USA	0.970	1.006	0.964
Austria	2.369	0.747	3.170
Croatia	0.896	1.019	0.880
Switzerland	3.411	0.555	6.146
Slovakia	0.152	1.157	0.131
Total of the former twelve countries	*1.000*	*1.000*	*1.000*

Source: The authors' own calculation.

The *work-related* form is typical of the elderly immigrants who formerly carried out economic activity or work in Hungary. The Polish and Bulgarian cases are special because they reflect the inheritance of pre-1988 small-scale labour migration within the socialist block (*Iglicka* [2001]). Besides Polish miners and Bulgarian agricultural workers, Cuban, Vietnamese and Mongolian women also worked in Hungary based on bilateral agreements (*Hárs* [2002]). The number of Polish and Bulgarian elderly immigrants stagnated from the collapse of the former economic system and the economic disintegration of the region. The work-related immigrants could also arrive from Russia because a huge amount of military personnel served in Hungary. It is assumed that the former mixed marriages partly channelled this sort of immigration. (A lot of Hungarian male guest workers were employed in the German Democratic Republic. Similarly to the Russian case, the main motivation factor of intermarriages for many German wives was also immigration. At the same time, the migration of husbands with Hungarian origin could be judged as international return migration.) The proportion of actives was similar to that of the elderly within the reference groups of Polish (1.6 percent, 1.6 percent) and Russian citizens (1.5 percent, 2.0 percent). Bulgarians show an exceptional case because the share of the elderly was remarkably greater than that of the non-elderly at the beginning of 2008 (1.8 percent and 0.5 percent). (See Table 2.) The index score of

dissimilarity of generations, which reflects the deviation from family oriented reasons, is 3.5 for Bulgaria. It is the second highest value behind that of Switzerland (See Table 4.) meaning the weak role of family connected motivations in staying in Hungary. The age structure of Bulgarian immigrants was the second oldest among the twelve countries under examination. Those citizens of Bulgaria, who had formerly performed agricultural activity in Hungary, aged in place and there was no new immigrant flux maintaining their number or rejuvenating their composition (*Mód* [2003]).

Return migration is considered as a counter-flow of previous emigration. In other words, return migration is the end of emigration (*Altamirano* [1995], *Rodríguez–Fernández-Mayoralas–Rojo* [1998], p. 239.). This form is similar to the amenity-seeking type: it is an element of the most simple migration system formation. Recent return migration to Hungary is one of the consequences of extensive emigration with only few labour motivations that began after the Second World War and was caused by the isolation of the Western and Eastern blocks. Hungarians did not move to the West as guest workers (*Hárs* [2002]), and they had no chance to join the guest workers' mass movements in a legal way, either. Thus, our connection to the Western labour migration system was only limited and unidirectional. About 400 000 Hungarians have left the country directly across the iron curtain or indirectly with tourist passport since 1956 (*Hablicsek–Illés* [2007]). As a result of the previous processes, elderly return migration started immediately after the collapse of the socialist political regime. The relatively fast start is a distinguishing feature of this form because the family oriented- and the amenity seeking types started only half a decade later. Return migration from Germany stemmed from several sources. Following the historical logic, its first source was the second generation of ethnic German emigrants who had been forced away from Hungary as a direct consequence of the Second World War (*Czibulka–Heinz–Lakatos* [2004]). An additional source could be those Hungarian emigrants who had left the country after the 1956 Revolution and had been admitted – in the greatest number – to Germany as political refugees. Besides the former ones, 3-4 thousand illegal emigrants as a third source were directed mainly to West Germany every year. Germany was the primary receiving country of the emigration hump from 1988 to 1992 but based on the juvenile age structure of Hungarian emigrants, it is not likely that this last wave would form a fourth source.

Before the Second World War, the United States of America was the main destination country of the emigration flow to the New World. After that, from the sources mentioned in the section on West Germany, a large number of immigrant population with Hungarian background evolved there. It is interesting to note that according to *Warnes*' contribution ([2001] p. 382.) on US retired pension beneficiaries overseas, Hungary as a target area had a high growth rate (12.7%) between 1997 and 1999.

This indicated the intensification of elderly migration to Hungary that is consistent with the Hungarian data. (See Appendix.) According to the most recent Eurostat figures, approximately 86 thousand Hungarian emigrants lived in 30 European countries in 2006. More than three-quarters of them lived in Germany (57%), Austria (19%) and Switzerland (4%), forming a basis for elderly return migration to Hungary.

The *amenity seeking* form dealt with by a great number of studies is a relatively new sort of international retirement migration (*King–Warnes–Williams* [2000], *O'Reilly* [2000], *Williams et al.* [2000], *Casado-Díaz–Kaiser–Warnes* [2004], *Oliver* [2007]). The number of cases belonging to this type has been increasing rapidly since the 1980s and its growth rate is greater than that of other IRM types in the European North-South relation (*Warnes* [2001]). This form can be characterised by high independence of work- and crisis-related reasons and less importance of family-related motivations (*King–Warnes–Williams* [1998] p. 101., 106.). It means return to a country (except for the home countries), where former experiences were gained. Amenity seeking elderly migration is nothing else than environmental preferences and lifestyle-led elderly migration with former tourist experiences gained in the destination area. A high rate of multiple-residence, multiple identity and peripatetic lifestyle is also its common distinguishing feature (*King–Warnes–Williams* [2000]). In this case, migration is not a clearly separate action but an element of the mobility system generated by multiple spatial moves. *King–Warnes–Williams* ([1998] p. 93.) pointed out that IRM is not necessarily the final stage in the migratory life course of individuals since it often involves or stimulates derivative or following migration back to the former residence or somewhere else (*Casado-Díaz–Kaiser–Warnes* [2004] p. 373.). In an inland country like Hungary with dry continental climate and dissimilar history of tourism, it is a difficult problem to conceptualise this new phenomenon investigated usually in warm coastal areas. What factors are attractive? The partial answer is as follows (*Csordás–Juray* [2007], *Michalkó–Lőrincz* [2007], *Rátz–Michalkó* [2008]):

– attractions of Hungary drawing the tourists to Budapest, the overcrowded capital (no),
– Lake Balaton, the second attraction of the country till the end of the 1990s (maybe or already not),
– old and newly created spas (yes),
– cottages close to Lake Balaton or spas (yes),
– cheap farmhouses in remote small villages or on the Great Hungarian Plain (yes),
– green and secure environment, silence, cheap (especially healthcare) services (yes).

The former range of possible attractions was merely identified in accordance with the regional surveys of one of the authors and the relevant literature reviewed previously. We are aware that the explanatory power of the listed factors can not be proved or cancelled entirely on the basis of country-level macro data. However, there are two simple statistical methods giving insight into amenity seeking IRM. The first is the investigation of the change in affluence figures of some selected sending countries. It is combined with searching of over-representation of IRM in the context of the elderly immigrant subpopulation of Hungary. The official data of the Hungarian Central Statistical Office show impressive German and Swiss dynamics since their average annual growth rates were approximately 13.6 and 6.6 respectively, between 1996 and 2008. The volume of Austrian IRM did not increase considerably, while that of American IRM remained stable. As a *second* method, we compared the distribution of the sixty-and-over age group with that of the fourteen-and-below age group by country of origin. (See Table 3.) At the end of the investigation period, a great deal of difference was discovered between these figures (in the advantage of the elderly) in the case of two countries (Austria 36.9 percent and 5.2 percent; Switzerland 53.2 percent and 2.6 percent). The proportion of the elderly with German origin was a little bit lower (32.9 percent for the sixty-and-over age group; 3.0 percent for the fourteen-and-below age group).

Thirdly, it is considered as an assumption that the high index of dissimilarity of generations due to family related reasons reflects the significant role of amenity-seeking moves. Therefore, we suppose that amenity seeking motives play a significant role in Swiss (6.1), Austrian (3.2) and German (2.7) migrants' life and have smaller explanatory power on the immigration of US citizens (1.0).

Crisis-related IRM is the sixth category. It was defined for special situations that are more complex than the classical refugee flows. Such case arose, for example, in the successor states of Yugoslavia during the civil war (*King* [2002] pp. 96–97., *Sirkeci* [2005]).

2. Hypothetical motivational system

In this section we anticipate that the purely one-motif-form of IRM does not exist in reality, and place emphasis again on the interconnectedness of different IRM classes presented previously. We weighted the types by countries and compassed the typologies into a coherent motivational system in order to make international comparison.

An indirect estimation was made to test the relative weight of each type mentioned in the previous chapter on the one hand, and to draw comparison with another research on the other. We constructed a hierarchical motivational system of citizens from the top twelve sending countries (covering more than four-fifths of IRM to Hungary at the beginning of 2008) in which the elderly immigrants staying in Hungary were classified by the most reliable three groups of IRM, assuming that the fourth one, namely the ethnic factor (*Kocsis–Bottlik–Tátrai* [2006]) related to all countries. In other words, the sending countries were categorized according to their firstly, secondly and thirdly dominant retirement migrant types living in Hungary, completed with a constant that is the ethnic Hungarian background. We suppose that though each migration class associates with separable motivations for migration and has different effects on the receiving country, it reflects the main motive of migration or migrants, too. Based on the various impacts of different IRM types, conclusions were drawn in the form of hypotheses on IRM related to Hungary. Table 5 includes the earlier discussed facts and hypotheses in a complex and coherent system.

Table 5

Types of international retirement migration (IRM) in Hungary by citizenship of immigrants

Citizenship	First motive	Second motive	Third motive	Fourth motive
Romanian	family oriented	work related	higher pension hunting	ethnic related
Ukrainian	work related	family oriented	higher pension hunting	ethnic related
German	return	family oriented	amenity seeking	ethnic related
Serb	crisis related	family oriented	work related	ethnic related
Bulgarian	work related	family oriented	return	ethnic related
Russian	work related	higher pension hunting	family oriented	ethnic related
Polish	work related	family oriented	return	ethnic related
US	return	family oriented	amenity seeking	ethnic related
Austrian	return	amenity seeking	family oriented	ethnic related
Croatian	crisis related	family oriented	return	ethnic related
Swiss	return	amenity seeking	family oriented	ethnic related
Slovakian	family oriented	work related	return	ethnic related

Source: The authors' own calculation.

In order to compare our indirect-estimation-based motivational system with other results, we had to quantify the perviously mentioned structure of types by sending countries. Therefore we created weights for each type by citizenship of immigrants.

The weight of the first motivator type was four multiplied by the number of the elderly by citizenship in 2008, the second motivator type was three multiplied by the number of the elderly by citizenship in 2008, the third motivator type was two multiplied by the number of the elderly by citizenship in 2008, and the fourth as a constant motivator type (ethnicity) was one multiplied by the number of the elderly by citizenship in 2008.

Table 6

Relative weights of IRM types by citizenship

Citizenship	First motivator	Second motivator	Third motivator	Fourth motivator
Romanian	family oriented (4)	work related (3)	higher pension hunting (2)	ethnic related (1)
Ukrainian	work related (4)	family oriented (3)	higher pension hunting (2)	ethnic related (1)
German	return (4)	family oriented (3)	amenity seeking (2)	ethnic related (1)
Serb	crisis related (4)	family oriented (3)	work related (2)	ethnic related (1)
Bulgarian	work related (4)	family oriented (3)	return (2)	ethnic related (1)
Russian	work related (4)	higher pension hunting (3)	family oriented (2)	ethnic related (1)
Polish	work related (4)	family oriented (3)	return (2)	ethnic related (1)
US	return (4)	family oriented (3)	amenity seeking (2)	ethnic related (1)
Austrian	return (4)	amenity seeking (3)	family oriented (2)	ethnic related (1)
Croatian	crisis related (4)	family oriented (3)	return (2)	ethnic related (1)
Swiss	return (4)	amenity seeking (3)	family oriented (2)	ethnic related (1)
Slovakian	family oriented (4)	work related (3)	return (2)	ethnic related (1)

Source: The authors' own calculation.

Concerning Table 6, it is supposed firstly that the relative distance of the different types from one another is the same. Secondly, we regarded the effect of the different IMR forms on the absolute number of retirement migrant stocks in 2008 by country of citizenship. (See Table 1.) This is due to the fact that the number of immigrants staying in Hungary depends on four factors. The emigration figures and the changes of status, of which the acquisition of Hungarian citizenship is the most important, decrease the absolute number of the elderly immigrant stock just as the number of deaths of immigrants. The ageing process produces new elderly immigrants (of sixty years and over) in Hungary year by year; in other words, ageing in place (*Attias-Donfut–Tessier–Wolff* [2005]) increases the total number of international elderly migrants. Thirdly, in the absence of reliable statistical data, we do not take into account

the effect of migration units (groups of people who moved together) in which the interrelation of motives between members is more interlaced than among individual migrants.

Hereinafter, Table 6 is extended in a manner that we aggregated the ranked motivators to include also the effect of the country of citizenship. In Table 7 the elements of frequency distribution (X) are multiplied by the weight of motivators (F) by each cell. Results are labelled as weighted frequencies of IRM types. Adding these values together by rows, total (T) column is got as a final result, which is the weighted frequency distribution of IRM types related to Hungary. The result is of standard distribution expressed as a percentage.

Table 7

The motivational system of IRM by types

Types (X)		Motivators (F)				Total (T)	Proportion (percent)
		1. f_1	2. f_2	3. f_3	4. f_4		
Family oriented	x_1	4×7 843=31 372	3×11 072=33 216	2×1 748=3 496	1×0=0	68 084	32.9
Return	x_2	4×6 363=25 452	3×0=0	2×1 060=2 120	1×0=0	27 572	13.3
Work related	x_3	4×3 567=14 268	3×7 843=23 529	2×2 771=5 542	1×0=0	43 339	21.0
Ethnic related	x_4	4×0=0	3×0=0	2×0=0	1×20 663=20 663	20 663	10.0
Amenity seeking	x_5	4×0=0	3×1261=3 783	2×5 102=10 204	1×0=0	13 987	6.8
Crisis related	x_6	4×2 890=11 560	3×0=0	2×0=0	1×0=0	11 560	5.6
Higher pension hunting	x_7	4×0=0	3×487=1 461	2×9 982=19 964	1×0=0	21 425	10.4
Total		*82 652*	*61 989*	*41 326*	*20 663*	*206 630*	*100.0*

Source: The authors' own calculation.

The types are ranked as follows in descending order: family oriented (32.9%), work related (21.0%), return (13.3%), higher pension hunting (10.4%), ethnic related (10.0%), amenity seeking (6.8%), and crisis related (5.6%) ones. Comparing this motivational structure with the reasons of residing in four southern European destinations listed by *King–Warnes–Williams* ([2000] p. 94.), we can offer some remarks on the differences between IRMs to inland with dry continental climate and to coastal areas with Mediterranean climate. The role of family related links was significantly higher in inland (32.9%) than in coastal areas (7.5%). The same can be observed in the case of work- or business related reasons (21.0 percent and 3.3 percent). However, the amenity related motivators such as climate, environment, peaceful life, health, lower living costs, social advantages (the presence of the national community

and friends, lively social life, opportunity for relatives to visit, friendly local population) and admiration of the destination country had overwhelmingly higher proportion in the British retirement migration to the Mediterranean than in the elderly immigration to Hungary (76.9 percent and 6.8 percent). Ethnic related sub-reasons were also found among the factors of social (the presence of the British community) and practical advantages (English is widely spoken) in the Mediterranean survey. All in all, a total of 5 percent was received for ethnic related motives, which is the half of the relevant Hungarian figure derived from the constant (10%).

Walters' article ([2000] p. 149.) provides a subsequent opportunity for comparison. He investigated three types of later-life migration within the United States between 1985 and 1990. The amenity migrants, as first type, constituted 46 percent of all the retired inner movers, which were characterised by residential and economic independence with a distinctive spatial pattern of immigration. The residentially and economically dependent assistance migrants were the second type with 28 percent. They can be described by the combined effects of low income and widowhood. Many of them lived with their adult children or in low-cost accommodations. The last type consisted of severely disabled migrants without spouse, admitted to nursing homes or other institutions. This group amounted to 26 percent of all retired migrants.

Based on these three independent researches, it can be concluded that the disability-led elderly migration flows did not cross the international borders. In researches conducted not only on attractive environmental areas but also on the country as a whole, the share of assistance migrants with family orientation reached the one-quarter of all elderly migrants. In Hungary, 6.8 percent of the elderly immigrants had amenity seeking motives. The relevant US value was 46 percent, which is still lower than the earlier-mentioned proportion of British retirement migration to the Mediterranean region (76.9%). *Rodríguez–Fernández-Mayoralas–Rojo* ([1998] p. 189.) reported the highest share in their study on European retirees on the Costa del Sol, one of the most popular resorts of IRM in Spain.

In this section of the paper, we highlighted the significant structural and motivational differences between the inland- (*Kulcsar–Bolender–Brown* [2008]) and coastal later life migration. We can assume that elderly migration to Lake Balaton is semi-costal. The high proportion of family oriented, work related and return motivational types characterised the Hungarian situation. Additionally, we also identified two peculiar, namely the crisis related and the pension hunting motives. These processes reflect the otherness of IRM to Hungary (*Williams–Baláz* [1999], *Kovács* [2000], *Nemes Nagy* [2002], *Kuus* [2004]) in comparison with British IRM to the Mediterranean region. However, the system of motivations has complex features, and not only the macro factors (*Nell* [2004]) but also the human agents (*Ley* [2004]) played important roles in both cases.

3. Conclusions

IRM is an emerging phenomenon of the second half of the twentieth century. We analysed the heterogeneous mass of international elderly migrants from demographic, spatial, historical and legal points of view and divided the IRM into the following seven motivational types: family oriented, return, work-driven, amenity seeking, higher pension hunting, crises-led, and ethnic-related ones. We created a motivational system of the twelve most important sending countries using an indirect estimation method. The system of types of IRM based on empirical materials was a cognitive construction, in fact. The elements of this extremely flexible system (sending countries, types, weights) could be modified in accordance with the specific research aims. It takes into account a number of sending countries from which trustworthy information can be gained and also several migration types relevant for the receiving country. The absolute number of weights depends on the number of types investigated, but their values are changed as the researcher wishes. The method can be extended to the other stages of the life course (for instance childhood, students, active earners), too. Moreover, there is no doubt that the method is suitable for investigating all age brackets covered by this research. As a result, the paper provides a method applicable, in particular, to comparative studies. Our primary aim was to examine the Hungarian patterns of IRM, and the results were embedded into the international research context.

The results showed high significance of the family oriented, work driven and return types; in contrast to this, the amenity seeking type played a smaller part in the motivational system of IRM to Hungary than in that of British IRM to the Mediterranean region. *Walters* [2000] distinguished three different types of elderly migrants within the United States. *King–Warnes–Williams*' [2000] primary motives covered five types in the Mediterranean region. In addition to them, we identified two new sorts of IRM, namely the crisis-led and the higher pension hunting types. It is very likely that the number of international elderly migrants is more than its internal counterpart. This statement seems valid as opposed to the previously cited researches of international scope since they did not address clearly the case of disabled migrants without spouse flowed to nursing homes or other institutions. However, the socially integrated Europe, the different price levels of full board in institutions and those of burials will increase the chance of the international movement of severely disabled persons.

The paper discusses a peculiar Hungarian kind of IRM, namely the higher pension hunting type. This sort of migration has high policy relevance, since a further increase in the number of higher pension hunting immigrants is in no way desirable within the present legal regulatory framework. If this phenomenon continues on a large scale, it will necessitate interference with the spontaneous processes. We pro-

pose that the Hungarian body launch international negotiations with Ukraine and Russia and make a decision on conversion from the old, territorial-principle-based social political agreements into new ones with share burdening. The best way of resolving the problem would be to conclude bilateral agreements (*Warnes* [2002], *Rédei* [2007]) except for countries accessed to the European Union (for instance Romania). Our general message addressed to policymakers is as follows: it is important to treat the various matters in a differentiated manner depending on the types of elderly immigrants.

Appendix I

We can foretell that the idea of methodological steps applied in the paper was compiled from the general table method of demography within which life table computation is most widely used, especially in the analyses of mortality. In the following, we draft the method applied for turning the data of Table 3 into accurate mathematical formulas step by step.

X matrix means the elements of the types of International Retirement Migration (IRM).

$$X = \begin{pmatrix} x_{11} & x_{12} & x_{13} & x_{14} \\ x_{21} & .. & .. & .. \\ .. & & & .. \\ .. & & & .. \\ & & & .. \\ .. & .. & .. & .. \\ x_{71} & x_{72} & x_{73} & x_{74} \end{pmatrix}.$$

F matrix signifies the weights of motivators multiplied by the absolute numbers of those retirement migrants (60–X) of each country who were staying in Hungary at the beginning of 2008.

$$F = \begin{pmatrix} f_1 \\ f_2 \\ f_3 \\ f_4 \end{pmatrix}.$$

T matrix (Total column) marks the sum of the rows and it equals to *X* matrix multiplied by *F* matrix.

$$T = X \cdot F = \begin{pmatrix} x_{11} & x_{12} & x_{13} & x_{14} \\ x_{21} & .. & .. & .. \\ .. & & & .. \\ .. & & & .. \\ & & & .. \\ .. & .. & .. & .. \\ x_{71} & x_{72} & x_{73} & x_{74} \end{pmatrix} \cdot \begin{pmatrix} f_1 \\ f_2 \\ f_3 \\ f_4 \end{pmatrix} =$$

$$= \left(\sum_{i=1}^{4} x_{1i} \cdot f_i \sum_{i=1}^{4} x_{2i} \cdot f_i \sum_{i=1}^{4} x_{3i} \cdot f_i \sum_{i=1}^{4} x_{4i} \cdot f_i \sum_{i=1}^{4} x_{5i} \cdot f_i \sum_{i=1}^{4} x_{6i} \cdot f_i \sum_{i=1}^{4} x_{7i} \cdot f_i \right)$$

Last column *D* indicates the proportion of the sum of the rows (*T*). In other words *D* matrix means *X* matrix weighted by *F* matrix. This is equal to the distribution of *T* matrix.

$$D = \left(\frac{\sum_{i=1}^{4} x_{1i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{2i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{3i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{4i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{5i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{6i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \frac{\sum_{i=1}^{4} x_{7i} \cdot f_i}{\sum_{k=1}^{7} \sum_{i=1}^{4} x_{ki} \cdot f_i} \right)$$

Appendix II

Table A 1

Immigrant foreign citizens by age group and country of origin, 1996–1999
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	1 838	16 813	2 838	*21 489*
Ukraine	1 007	5 151	844	*7 002*
Germany	162	2 117	438	*2 717*
Serbia	834	4 127	725	*5 686*
Bulgaria	40	202	31	*273*
Russia	256	1 415	152	*1 823*
Poland	29	591	14	*634*
USA	265	1 461	95	*1 821*
Austria	49	482	53	*584*

(Continued on the next page.)

(Continuation.)

Country	Age group			
	0–14	15–59	60–X	*Total*
Croatia	120	608	100	*828*
Switzerland	15	165	51	*231*
Slovakia	190	1 322	30	*1 542*
Total of the former twelve countries	*4 805*	*34 454*	*5 371*	*44 630*
Rest of Europe	1 076	4 524	260	*5 860*
Europe (including Russia)	*5 116*	*37 759*	*5 427*	*48 302*
Rest of the World (inlcuding USA)	1 653	12 489	776	*14 918*
Total	*6 769*	*50 248*	*6 203*	*63 220*

Source: Here and hereinafter the Demographic Database of the Hungarian Central Statistical Office.

Table A 2

Immigrant foreign citizens by age group and country of origin, 2000–2003
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	2 922	33 837	2 689	39 448
Ukraine	847	8 172	637	9 656
Germany	180	1 665	422	2 267
Serbia	447	3 140	364	3 951
Bulgaria	26	186	11	223
Russia	144	921	126	1 191
Poland	29	278	8	315
USA	270	1 411	130	1 811
Austria	37	354	66	457
Croatia	34	308	44	386
Switzerland	24	172	50	246
Slovakia	103	2 307	32	2 442
Total of the former twelve countries	*5 063*	*52 751*	*4 579*	*62 393*
Rest of Europe	820	4814	229	5863
Europe (including Russia)	*5 613*	*56 154*	*4 678*	*66 445*
Rest of the World (inlcuding USA)	1 586	9 171	627	11 384
Total	*7 199*	*65 325*	*5 305*	*77 829*

Table A 3

Immigrant foreign citizens by age-group and country of origin, 2004–2007
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	2 796	32 891	2 841	38 528
Ukraine	863	10 892	756	12 511
Germany	379	4 019	1 784	6 182
Serbia	511	5 532	795	6 838
Bulgaria	31	211	20	262
Russia	132	840	100	1 072
Poland	39	416	16	471
USA	297	1 427	141	1 865
Austria	184	1 077	336	1 597
Croatia	33	239	25	297
Switzerland	24	144	57	225
Slovakia	231	2 737	143	3 111
Total of the former twelve countries	*5 520*	*60 425*	*7 014*	*72 959*
Rest of Europe	790	5 702	523	7 015
Europe (including Russia)	*6 013*	*64 700*	*7 396*	*78 109*
Rest of the World (including USA)	2 324	13 852	801	16 977
Total	*8 337*	*78 552*	*8 197*	*95 086*

Table A 4

Immigrant foreign citizens by age-group and country of origin, 1996–2007
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	7 556	83 541	8 368	99 465
Ukraine	2 717	24 215	2 237	29 169
Germany	721	7 801	2 644	11 166
Serbia	1 792	12 799	1 884	16 475
Bulgaria	97	599	62	758
Russia	532	3 176	378	4 086
Poland	97	1 285	38	1 420

(Continued on the next page.)

(Continuation.)

Country	Age group			
	0–14	15–59	60–X	*Total*
USA	832	4 299	366	5 497
Austria	270	1 913	455	2 638
Croatia	187	1 155	169	1 511
Switzerland	63	481	158	702
Slovakia	524	6 366	205	7 095
Total of the former twelve countries	*15 388*	*147 630*	*16 964*	*179 982*
Rest of Europe	2 186	15 282	903	*18 371*
Europe (including Russia)	*16 742*	*158 613*	*17 501*	*192 856*
Rest of the World (including USA)	5 563	35 512	2 204	43 279
Total	*22 305*	*194 125*	*19 705*	*236 135*

Table A 5

Immigrants staying in Hungary by age-group and country of citizenship, 1 January 1996
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	7 760	54 095	3 850	65 705
Ukraine	617	3 341	474	4 432
Germany	142	2 596	349	3 087
Serbia	2 592	12 195	705	15 492
Bulgaria	49	1 105	466	1 620
Russia	98	957	69	1 124
Poland	229	4 037	255	4 521
USA	66	1 658	284	2 008
Austria	11	555	128	694
Croatia	59	441	32	532
Switzerland	13	151	47	211
Slovakia	51	425	14	490
Total of the former twelve countries	*11 687*	*81 556*	*6 673*	*99 916*
Rest of Europe	1 489	20 679	2 345	24 513
Europe (including Russia)	*13 110*	*100 577*	*8 734*	*122 421*
Rest of the World (including USA)	645	16 167	721	17 533
Total	*13 755*	*116 744*	*9 455*	*139 954*

Table A 6

Immigrants staying in Hungary by age-group and country of citizenship, 1 January 2000
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	5 448	45 654	6 241	57 343
Ukraine	1 405	8 083	1 528	11 016
Germany	297	8 314	1 020	9 631
Serbia	1 569	8 457	917	10 943
Bulgaria	71	1 001	427	1 499
Russia	316	2 436	250	3 002
Poland	146	3 647	351	4 144
USA	279	2 626	356	3 261
Austria	72	801	180	1 053
Croatia	157	915	90	1 162
Switzerland	23	267	132	422
Slovakia	99	1 577	41	1 717
Total of the former twelve countries	*9 882*	*83 778*	*11 533*	*105 193*
Rest of Europe	1 244	20 005	2 603	*23 852*
Europe (including Russia)	*10 847*	*101 157*	*13 780*	*125 784*
Rest of the World (including USA)	2 112	24 075	1 154	27 341
Total	*12 959*	*125 232*	*14 934*	*153 125*

Table A 7

Immigrants staying in Hungary by age-group and country of citizenship, 1 January 2004
(person)

Country	Age group			
	0–14	15–59	60–X	*Total*
Romania	4 771	43 693	7 212	55 676
Ukraine	1 273	9 903	1 920	13 096
Germany	206	5 845	1 342	7 393
Serbia	1 479	9 501	1 387	12 367
Bulgaria	49	679	390	1 118
Russia	258	1 700	286	2 244
Poland	71	1 882	243	2 196

(Continued on the next page.)

(Continuation.)

Country	Age group			
	0–14	15–59	60–X	*Total*
USA	271	1 195	237	1 703
Austria	59	504	217	780
Croatia	160	629	113	902
Switzerland	35	232	176	443
Slovakia	100	2 325	47	2 472
Total of the former twelve countries	*8 732*	*78 088*	*13 570*	*100 390*
Rest of Europe	800	9 747	1 681	12 228
Europe (including Russia)	*9 261*	*86 640*	*15 014*	*110 915*
Rest of the World (including USA)	2 927	15 453	814	19 194
Total	*12 188*	*102 093*	*15 828*	*130 109*

References

AINSAAR, M. [2004]: *Reasons for Move: A Study on Trends and Reasons of Internal Migration with Particular Interest in Estonia 1989–2000*. Turku University. Turku.

ATTIAS-DONFUT, C. – TESSIER, P. – WOLFF, F.-C. [2005]: Immigrants at Retirement. *Retraite et Société*. No. 44. (Best of 2005) pp. 6–39.

ATTIAS-DONFUT, C. – WOLFF, F.-C. [2005]: Transmigration and Life Choices at Retirement. *Retraite et Société*. No. 44. (Best of 2005) pp. 41–67.

ALTAMIRANO, A. T. [1995]: Return Migration on the Policy Agenda in Sweden. *Applied Geography.* Vol. 15. No. 2. pp. 267–278.

BROWN, D. L. – GLASGOW, N. [2008]: *Rural Retirement Migration*. Springer. New York.

CASADO-DIAZ, M. A. – KAISER, C. – WARNES, A. M. [2004]: Northern European Retired Residents in Nine Southern European Areas: Characteristics, Motivations and Adjustment. *Ageing and Society.* Vol. 24. No. 2. pp. 353–381.

CRIBIER, F. [1974]: Retirement Migration in France. In: *Kosinski, L. A. – Prothero, R. M.* (eds.): *People on the Move*. Matheum. London. pp. 361–363.

CZIBULKA, Z. – HEINZ, E. – LAKATOS, M. [2004]: *A magyarországi németek kitelepítése és az 1941. évi népszámlálás.* KSH. Budapest.

CSORDÁS, L. – JURAY, T. [2007]: A második otthonok mint térformáló tényezők. *Földrajzi Közlemények*. Vol. 131. No. 3. pp. 187–201.

FREY, W. H. – LIAW, K. L. – LIN, G. [2000]: State Magnets for Different Elderly Migrant Types in the United States. *International Journal of Population Geography.* Vol. 6. No. 1. pp. 21–44.

HABLICSEK, L. – ILLÉS, S. [2007]: 1956-os kivándorlás népességi hatásai. *Statisztikai Szemle*. Vol. 85. No. 2. pp. 157–172.

HÁRS, Á. [2002]: Channelling and Filtering Migration: Hungary's Bilateral Labour Migration Agreements. *International Journal of Population Geography.* Vol. 8. No. 2. pp. 165–182.

IGLICKA, K. [2001]: *Poland's Post-War Dynamic of Migration.* Ashgate. Aldershot.

ILLÉS, S. [2006]: Indirect Estimation on the Types of International Elderly Migration in Hungary. *Romanian Review on Political Geography.* Vol. 8. No. 1. pp. 55–63.

ILLÉS, S. [2007]: Polgármesteri szemmel a turizmusról és migrációról. *Comitatus.* Vol. 17. No. 10. pp. 50–66.

ILLÉS, S. – MICHALKÓ, G. [2008]: Relationships between International Tourism and Migration in Hungary: Tourism Flows and Foreign Property Ownership. *Tourism Geographies.* Vol. 10. No. 1. pp. 98–118.

KING, R. – WARNES, A. M. – WILLIAMS, A. M. [1998]: International Retirement Migration in Europe. *International Journal of Population Geography.* Vol. 4. No. 1. pp. 91–111.

KING, R. – WARNES, A. M. – WILLIAMS, A. M. [2000]: *Sunset Lives: British Retirement Migration to the Mediterranean.* Oxford. Berg.

KING, R. [2002]: Towards a New Map of European Migration. *International Journal of Population Geography.* Vol. 8. No. 1. pp. 89–106.

KOCSIS, K. – BOTTLIK, ZS. – TÁTRAI, P. [2006]: *Etnikai térfolyamatok a Kárpát-medence határainkon túli régióiban, 1989–2002*. MTA Földrajztudományi Kutatóintézet. Budapest.

KOVÁCS, Z. [2000]: Hungary at the Threshold of the New Millennium: The Human Geography of Transition. In: *Kovács, Z.* (ed.) *Hungary Towards the 21st Century – The Human Geography of Transition.* Geographical Research Institute of HAS. Budapest. pp. 11–27.

KULCSAR, L. J. – BOLENDER, B. C. – BROWN, D. L. [2008]: The Formation and Development of Rural Retirement Destinations. In: *Brown, D. L. – Glasgow, N.* (eds.): *Rural Retirement Migration.* Springer. New York. pp. 55–89.

KUUS, M. [2004]: Europe's Eastern Expansion and Reinscription of Otherness in East-Central Europe, *Progress in Human Geography.* Vol. 24. No. 3. pp. 472–489.

LEY, D. [2004]: Transnational Spaces and Everyday Lives. *Transactions of the Institute of British Geographers.* Vol. 29. No. 2. pp. 152–164.

LITWAK, E. – LONGINO, C. F. [1987]: Migration Patterns among the Elderly: Developmental Perspective. *Gerontologist.* Vol. 27. No. 2. pp. 266–272.

LUKÁCS, É. [2000]: Wanderbewegungen als Folgen eines Beitrittes der MOE-Länder – die Sicht Ungarns. In: *Hrbek, R.* (ed.) *Die Osterweiterung der Europäischen Union.* Europäisches Zentrum für Föderalismus-Forschung. Tübingen. pp. 68–86.

MEYER, J. W. – SPEARE, A. [1985]: Distinctive Elderly Mobility: Types and Determinants. *Economic Geography.* Vol. 61. No. 1. pp. 79–88.

MICHALKÓ, G. – LŐRINCZ, K. [2007]: A turizmus és az életminőség kapcsolatának nagyvárosi vetületei Magyarországon. *Földrajzi Közlemények*. Vol. 131. No. 3. pp. 157–169.

MÓD, L. [2003]: Bolgár kertészek Szentes környékén. *Alföldi tanulmányok.* 19. pp. 110–117.

NELL, L. M. [2004]: Conceptualising the Emergence of Immigrants Transnational Communities. *Migration Letters.* Vol. 1. No. 1. pp. 50–56.

NEMES NAGY, J. [2002]: Spatial Gravity Centres of the Dynamics and the Crisis in Hungary. *Hungarian Statistical Review.* Special Number 7. pp. 75–85.

OLIVER, C. [2007]: *Retirement Migration: Paradoxes of Ageing*. Routledge. London.

O'REILLY, K. [1995]: A New Trend in European Migration: A Contemporary British Migration to Fuengirola. Costa del Sol. *Geographical Viewpoint.* Vol. 23. No. 4. pp. 25–36.

O'REILLY, K. [2000]: *The British in the Costa Del Sol*. Routledge. London.

RÁTZ, T. – MICHALKÓ, G. [2008]: A Balaton turisztikai miliője: a magyar tenger sajátos atmoszférájának turizmusorientált vizsgálata. *Turizmus Bulletin*. Vol. 11. No. 4. pp. 13–19.

RÉDEI, M. [2007]: *Mozgásban a világ. A nemzetközi migráció földrajza.* ELTE Eötvös Kiadó. Budapest.

RODRÍGUEZ, V. – FERNÁNDEZ-MAYORALAS, G. – ROJO, F. [1998]: European Retirees on the Costa del Sol: A Cross National Comparison. *International Journal of Population Geography*. Vol. 4. No. 2. pp. 183–200.

SIRKECI, I. [2005]: Conflict and International Migration: Iraqi Turkmen in Turkey. In: *Iontsev, V.* (ed.) *International Migration Trends*. MAX Press. Moscow. pp. 193–201.

SZŐKE, A. [2006]: New Forms of Mobility Among Western European Retirees: German Migrants in South-West Hungary. In: *Szczepaniková, A. – Canek, M. – Gril, J.* (eds.) *Migration Processes in Central and Eastern Europe: Unpacking the Diversity*. Multicultural Center. Prague. pp. 42–45.

WALTERS, W. H. [2000]: Types and Patterns of Later-life Migration. *Geografiska Annaler. Series B, Human Geography*. Vol. 82. No. 3. pp. 129–147.

WARNES, A. M. [2001]: The International Dispersal of Pensioners of Affluent Countries. *International Journal of Population Geography.* Vol. 7. No. 3. pp. 373–388.

WARNES, A. M. [2002]: The Challenge of Intra-Union and In-Migration to "Social Europe". *Journal of Ethnic and Migration Studies.* Vol. 28. No. 2. pp. 135–152.

WARNES, A. M. ET AL. [2004]: The Diversity and Welfare of Older Migrants in Europe. *Ageing and Society.* Vol. 24. No. 2. pp. 307–324.

WILLIAMS, A. M. – BALÁZ, V. [1999]: Transformation and Division in Central Europe. In: *Hudson, R. – Williams, A. M.* (eds): *Divided Europe*. Sage. London. pp. 162–185.

WILLIAMS, A. M. ET AL. [2000]: Tourism and International Retirement Migration: New Forms and Old Relationship in Southern Europe. *Tourism Geographies.* Vol. 2. No. 1. pp. 28–49.

WISEMAN, R. F. – ROSEMAN, C. C. [1979]: A Typology of Elderly Migration Based on the Decision Making Process. *Economic Geography.* Vol. 55. No. 2. pp. 324–337.

WITHOL DE WENDEN, C. [2001]: Un essai de typologie des nouvelles mobilités. *Hommes et Migrations*. No. 1233. pp. 5–12.

Methodological Practice and Practical Methodology: Fifteen Years in Nonprofit Statistics

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The Hungarian Central Statistical Office has been carrying out annual surveys on the nonprofit sector since 1993. A method of data collection and processing has been developed for the last 15 years. The study presents not only the methodology, but its function in the practice describing the features of the Hungarian civil sphere. This process is performed by different statistical indicators referring to 2006 and in time series. The data on the size, composition, finance and human resources of the sector can show a satisfying picture to foreign experts having interest in Hungarian nonprofit research.

KEYWORDS:
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"The significance of social associations has recently increased. The activity of associations has impacts on nearly every aspect of social life today. Millions of people are linked with one another in these organisations. Their operations are based on huge annual incomes amounting to millions. Such associations exercise a significant influence on the development of social life, as well as on the direction and substance of this development as they mobilise the moral purposes and material resources within society. Therefore associational life deserves great attention in national-political considerations, and the government endeavours to regulate associational work in line with the growing public interest in these affairs are entirely justified" (*Dobrovits* [1936]). These thoughts written by *Sándor Dobrovits* in the introduction to his work entitled "Associations of Budapest" in 1936 are also relevant to the current Hungarian nonprofit sector. After 18 years of changes in the political system, we can say that a three-sectored economy has been developed in Hungary. In this system the civil society operates sometimes in cooperation, sometimes in competition with the state and the for-profit spheres. The Hungarian nonprofit sector has experienced a long and difficult development and has recently been transformed into a widely recognised and lauded actor within the country.

1. The history of the nonprofit sector in Hungary after the Second World War

The communist regime that took over Hungary in 1947 and lasted more than 40 years halted the development of the voluntary sector, destroying and vilifying civil society. The government banned most of the voluntary associations. What remained of the voluntary sector was nationalized and brought under state control. The right of association was denied, and there was also no way to set up a foundation. On paper, the communist regime had the loftiest declarations concerning the right of association. However, in practice, any application of such declarations and written laws would have been inconceivable.

The 1956 Revolution revealed that the communist governments had been able to dissolve most of the voluntary organisations, but they could not completely eradicate citizens' autonomy, solidarity and private initiatives. The failed revolution was followed by a tacit compromise: a more flexible version of state-socialism was devel-

oped. Gradual reforms were introduced in the economy, more freedom was granted to people in their private life. Reforms, gradual changes, realization of the poor performance of state delivery systems, all led to a more tolerant government attitude towards civic initiatives. From the 1980s this change speeded up, and after the mid-1980s it became obvious that the crisis of the system was so fundamental that any fine-tuning would have been useless. There was a need for a major overhaul.

This gradual process of reforms explains the fact that the rehabilitation of civil society was long underway before the final collapse of the communist system in Hungary. One of these steps was the "rehabilitation" of foundations: the legal provisions pertaining to them reappeared in the Civil Code in 1987. By the time the breakdown of the Soviet Bloc had made fundamental political changes feasible in 1989, civil society organisations were numerous, developed and widespread enough to become important actors of the systemic change. Since then, they have developed together with other institutions of the economy and society, trying to find appropriate answers to the challenges created by the process of transition.

As the Parliament passed the Law on Association in 1989, and thus the legal guarantees of the freedom of association became enacted, associational life in Hungary took off both qualitatively and quantitatively. Organisations were mushrooming, their number tripled during the 1990s, and from almost nothing, a foundational sector of nearly 20 000 was born. New legal forms were created such as public foundations, public benefit companies, public law associations, voluntary mutual insurance funds, and these organisations became day to day actors within a wide range of different fields.

At the same time the Hungarian Central Statistical Office recognized the socio-economic significance of this movement and started the regular statistical observation of foundations and associations in order to track the development of the non-profit sector. This process is still going on, nevertheless, it is worth mentioning that this work had some antecedents.

2. The history of the associational statistics

The first plan for a nationwide census of associations emerged in 1848 in the program of the National Statistical Office led by *Elek Fényes*. However, the first relevant report was issued only in 1862 by the Statistical Committee of the Hungarian Academy of Sciences (*Hunfalvy* [1862b]). It was not actually the result of a survey, but only a report based on different official data (*Domokos* [1968] p. 221.) in which the organisations were sorted by counties and five activity fields, and the

names of organisations in addition to those of their presidents and members were included.

The first really nationwide data collection took place in 1878. This census was started by a law accepted in 1874, which stated that "in call of the statistical office, private institutes, associations, and companies dealing with public purposes are obliged to send directly the office their operating data necessary in order to measure year by year the public state of the countries of the Hungarian Crown". In the end, data was gathered by municipalities, but this action did not prove easy since – as *Károly Keleti* wrote in the introduction of the quite ample publication containing the results – "there were so many mistakes and deficiencies in the presented data that the number of letters of admonition posted to the associations and companies amounted to 3048" (*Vargha* [1880]). Despite this, it succeeded in collecting rather detailed data on 4000 organisations including not only the purpose, the year of establishment and the membership of associations, but also the financial background such as membership fee, income, expenditure, assets (*Reisz* [1988]). As far as the field of activity was concerned, the organisations were classified in 16 groups and 76 subgroups (*Bocz* [1992] p. 843.). The importance of this analysis was enhanced by the fact that similar data collection did not occur during the period of the Austro-Hungarian Monarchy, although it would have been a basic survey serving as a starting point to the further deep and exhaustive statistical observations according to the original intention.

The next such comprehensive census of associations resembling that of 1878 was carried out after 54 years, when the Hungarian Central Statistical Office measured the number of associations, their membership and financial situation. As the questionnaire asked information on the year of establishment, it made it possible to estimate the number of organisations in the preceding decades (*Sebestény* [2003]).

Then another long pause came that lasted until 1970, when a survey on voluntary associations was conducted, which was repeated in 1982 and in 1989. The associational surveys taken place during that period, represented a prominent chapter in the history of the Hungarian statistics.

3. The emergence of the Hungarian nonprofit statistics

The economic transformation after the fall of the regime brought about the adoption of the economic information system of the developed countries. This was the way in which the internal as well as external observers managed to compare the performance of the accession countries. The adoption of the statistical standards of the SNA (System of National Accounts) and its European version, the ESA (European

System of Accounts) was a part of this development. When calculating the economic performance, the SNA and the ESA categorise the economic units into five institutional sectors, which are: the non-financial corporations sector, the financial corporations sector, the general government sector, the households sector and the nonprofit institutions serving households (NPISH). During the socialist era there was no need for individual recording of the latter category, partly due to its negligible economic significance.

After the fall of the socialist regime, the first publication of the Hungarian Central Statistical Office (HCSO) dealing with nonprofit organisations was published under the title "Social Organisations in Hungary in 1991" (*KSH* [1993]). This short overview failed to provide adequately precise data on the nonprofit sector, it only managed to draw the readers' attention to lack of available information. As a result of this neither comprehensive nor representative data collection, it became clear that no records system suitable for even showing the exact number of such organisations existed. It was due to the fact that the official records system kept at the courts was not helpful in monitoring the cessation of organisations. This justified the establishment of a new, specialised section within the HCSO. The section established in 1992 was given the task of collecting wide-scope data on nonprofit organisations operating in Hungary. The primary aim of the data collection was to assess, in co-operation with the Department of National Accounts, the contribution of the nonprofit sector to the national economy.

Another reason why the information collection started again was the fact that the socio-economic changes led to decreasing public trust in the governmental sector's problem-solving ability and the concurrent growing importance of nonprofit organisations. Nevertheless, there was little empirical knowledge about the number, economic strength and economic characteristics of nonprofit organisations or the structures of their activities. In the developed countries the academic examination of the nonprofit sector had started in the 1970s and 1980s, although, the first large-scale international comparative study using a uniform system of definitions and approaches only took place in the early 1990s.[1]

When laying the foundations of the nonprofit statistics, the HCSO had a presupposition, namely that the relatively small share of the nonprofit sector (0.5-0.7 percent) within the GDP was going to grow in the future. Projections indicated that during the development of Central-European countries a nonprofit sector similar in size and structure to that of the developed world would emerge. Besides monitoring this process, the records made it possible to get a picture of unfolding social movements.

[1] This was the Johns Hopkins University Comparative Nonprofit Sector Project conducted by *Lester Salamon* and his research team in which Hungary also participated. The survey was repeated in 1995, when the necessary information referring to Hungary was already presented on the basis of data published by the HCSO (*Salamon–Anheier* [1995], [1999]; *Salamon et al.* [1999], *Salamon–Sokolowski–List* [2003]; *Sebestény* [2001]).

The knowledge emerging from data collection helped civil advocacy, governmental organisations, as well as researchers dealing with the nonprofit sector. We are convinced that this continuous statistical activity played a significant and stimulating role in forming the state "civic" policy appeared in this period, which targeted the development of, and cooperation with the third sector. The following crucial laws were the legal outcomes of this process:

– 1997: 1 percent of the personal income tax can be given to nonprofit organisations selected by taxpayers;

– 1998: Nonprofit organisations serving public interest can apply for the public benefit and special public benefit status; the public benefit status becomes a condition for preferential tax treatment;

– 2004: Institutionalisation of public support to civil society organisations by the creation of the National Civil Fund;

– 2005: Legal regulation of tax-free allowances to volunteers; the legal form of public benefit companies is substituted by that of nonprofit companies; limitation of the individual donors' tax preferences *(Kuti* [2008] p. 13.*)*.

The annual statistical observation of the third sector became such an important and indispensable part of mapping the social conditions of the country that it appears as a separate element of the new governmental civil strategy. As far as the future of this survey is concerned, the present practice can be both a basis and a starting point for making regular nonprofit satellite accounts in order to meet international recommendations.

4. Definitions and concepts

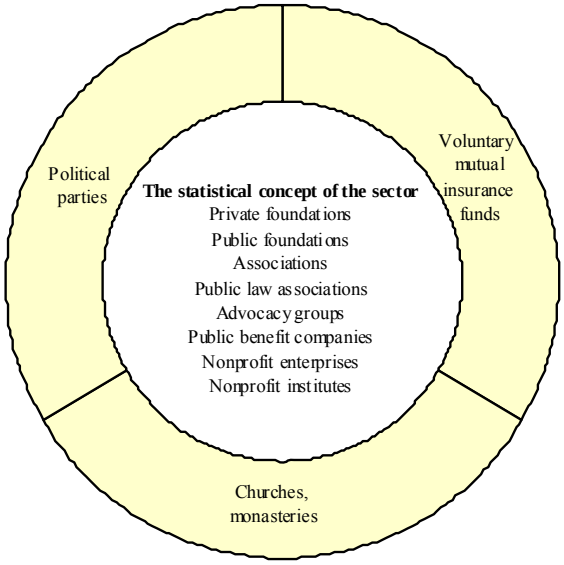
The data available in connection with the nonprofit sector are confusingly diverse. Data users often complain, justly, about discrepancies of information coming from various sources. Sometimes the differences are large, therefore it seems to be necessary to start our review by clarifying the definitions and the content issues.

In today's Hungarian practice, there are three different definitions used for the nonprofit sector (*Balogh–Mészáros–Sebestény* [2003]). Among these definitions the legal definition is the broadest. According to this, all non profit oriented organisations (foundations, public foundations, public law associations, public benefit companies, nonprofit enterprises, voluntary mutual insurance funds, and social organisa-

tions falling under the scope of the association law), which at the same time do not belong to the government sector, are regarded as part of the nonprofit sector, if they are registered as legal entities.

The statistical definition is somewhat stricter and more pragmatic, and it is actually based on the criteria (the prohibition of distributing the profit; organisational independence from the governmental sector; institutionalised status /independent legal entity/; public service nature; some elements of volunteerism and the exclusion of a party-like operation) established in international practice. Although it is not as broad as the legal definition (see Figure 1), it is similar in logic since it uses the organisational forms described in the Civil Code as its starting point. According to this definition, the following organisations do not fall under the category of the nonprofit sector: voluntary mutual insurance funds (since the nonprofit-distribution constraint does not prevail in their case), political parties (as their mission is to acquire public and governmental powers), and churches or monasteries[2] (whereas the regulation that defines the operational framework for secular nonprofit organisations does not apply to them).

Figure 1. The relation of the legal (broader) and statistical (narrower) concepts of the nonprofit sector



[2] In international practice, it is strongly debated whether churches can be regarded as part of the nonprofit sector. In Hungary, the HCSO and the historical churches drew up an agreement in 1993 according to which churches, denominations, and monasteries do not fall under the scope of the statistical observation of the nonprofit category, while church foundations and religious associations do.

The SNA definition is based on completely different principles. When compiling national accounts, from organisations falling into the category of the statistical definition (inner circle of Figure 1) those ones have to be regarded as part of the nonprofit sector serving households, which conduct income-gaining activities only to a limited extent and list private donations as their dominant source of financing. The organisations that primarily live off of state support are part of the government sector, while the nonprofit service providers relying mainly on income from fees and the employers' advocacy groups have to be included in the corporate sector. At the same time, for example, from the organisations being in the outer circle of Figure 1 that do not comply with the statistical definition but satisfy the description of the legal one, political parties, churches, and also monasteries are included in the nonprofit sector serving households in the system of national accounts. However, the economic performance of voluntary mutual insurance funds is included in the financial corporations sector.

5. The description of the types of nonprofit organisations

Not all of the nonprofit types described so far are subject to our statistical observation, and the main forms, which are included, are outlined in the following, using *Éva Kuti*'s definitions ([2008] pp. 17–18.). There are two basic legal forms (voluntary associations, private foundations) of classical civil society organisations under Hungarian law. Two other kinds of organisations (public law associations, public law foundations) are intended to offer an institutional framework for government related nonprofit activities. The legal forms of nonprofit service provision are changing right now, public benefit companies are disappearing, while nonprofit companies and social cooperatives have been being developed.

Voluntary associations are autonomous membership organisations formed voluntarily for a purpose agreed upon by their members and stated in their articles of association. They must have registered members who organise to pursue actively the associations' aims. Although membership organisations are not necessarily called voluntary associations and special laws and government decrees may specify rules for some of them, the basic legal regulation of voluntary associations applies to all such organisations, including societies, clubs, self-help groups, federations, trade unions, mass organisations, social organisations, etc. These organisations can be formed around common interests, intentions, concerns, hobbies, personal problems, age, residence, profession, occupation, or support for particular institutions, ideas, and actions.

Public law associations are self-governing membership organisations, which can only be created by the Parliament through passing a specific law on their establishment. The Hungarian Academy of Sciences, the Chamber of Commerce and the chambers of some professions (such as doctors, lawyers, architects, etc.) have been transformed into public law associations since the creation of this legal form. Although the legal regulation of voluntary associations generally applies to public law associations, the government may vest additional authority over their members in this kind of associations (for instance official registration, quality control, the issue of licences, etc.).

Professional associations are incorporated cooperative associations founded by their members having legal personalities in order to improve the efficiency of their financial management, coordinate their economic activities, and represent their professional interests. A professional association shall not aim for profit; its members shall sustain unlimited joint and several liability for any liabilities exceeding its assets.

Foundations are organisations with endowments established to pursue durable public purposes. Their founders can be either private persons or organisations with legal personalities. Unlike associations, foundations do not have members. They are managed by a board. Their founders are not allowed to have a significant influence on the decisions of this board. Private foundations can take several different forms including operating foundations (for example foundations operating schools, nursing homes, health and cultural institutions; providing social services; publishing books and journals; managing local radio and television stations, etc.); grant seeking foundations exclusively supporting public institutions such as libraries, theatres, museums, schools, universities, hospitals, research institutes that established them or pursuing particular aims and projects (creation of monuments, organisation of festivals, or development of art collections); grant-making foundations that support either projects or organisations; and corporate foundations mostly supporting present or former employees of the companies.

Public law foundations are foundations established to take over some government tasks (for instance education, health care, public safety, etc.), which are defined in law as government responsibilities. Their founders can only be the Parliament, the Government and the municipalities. (These organisations can establish only this kind of foundations; they are not allowed to create private foundations at all.) The public law foundations are kept financially accountable by the State Audit Office. The founders can initiate the dissolution of a public law foundation if they think its function can be more efficiently fulfilled by another type of organisation. The property of the dissolved public law foundation reverts to its founder. Apart from these special provisions, the basic legal regulation of private foundations applies to public law foundations as well.

The public benefit companies and their successors, the nonprofit companies are private firms, which generally produce public goods thus they can get the public benefit status. Their occasional profit cannot be distributed among their owners, managers or employees, it must be used to pursue their public purposes. Apart from the non-distribution constraint, the basic economic regulation of ordinary private firms applies to them. This legal form best fits the nonprofit service providers, which cannot reasonably be organised as either foundations or voluntary associations. In some sense, the type of the newly emerging social cooperatives is already an intermediate legal form, halfway between the nonprofit and the for-profit sector. The importance of their membership, their public purposes and their eligibility for the public benefit or even special public benefit status link social cooperatives to the voluntary sector, while the disappearing non-distribution constraint is a point of similarity with the private for-profit corporations.[3]

6. Methodology

This chapter serves for giving a comprehensive account of different sources providing fundamental information on nonprofit organisations, and the description of the methodology how to produce a nation-wide database containing figures on organisational characteristics.

6.1. Different registers

The differences in the definitions themselves would be enough to steer the assessments concerning the size of the nonprofit sector in different directions. Another reason for the differences may lie in the fact that the data on the number of nonprofit organisations are available from several registers that are actually independent of each other. These registers differ in aims, content, operational principles and maintenance rules.

With the exception of public benefit companies, every nonprofit organisation that fulfils the legal definition's requirements, and that has been registered as an independent legal entity and has not been officially dissolved is included in the court register available for the public on the webpage of the Supreme Court (http://www.birosag.hu/engine.aspx?page=tarsszervsearch). Since a large number of

[3] At present, social cooperatives are not subjects to the nonprofit statistical observation.

dissolved associations and foundations that have lost their assets in many cases fail to legally confirm their cessation (for example their general assembly does not make a decision on the resolution of cessation) or to report it, this register contains several organisations that have in fact not been in operation for a long time. Therefore the number of organisations in the register by far exceeds the actual number of organisations.

The HCSO's database is supposed to solve this problem. It contains all the organisations' names, addresses, and the description of their activities, the data of their official representatives and their court registration number. The register is regularly updated via the help of an annually distributed questionnaire and by the usage of the data available from the court register of newly registered organisations. We also record reports on cessation or closure of operation. In order to check the validity of basic details, the questionnaires contain several control questions such as questions on availability and activity, which are to be confirmed by the data providers. As a source of information we do not only accept the official documents on cessation of operation but also if the affected party, or a person/ institution in connection with them provide information on cessation of the organisation. In this case we consider an organisation dissolved if it had long been connected to a wound-up institution (for example to a political mass organisation or to a state construction company or to an agricultural co-operative from before the change of the socialist regime) and after the winding up of those institutions they themselves disappeared with no trace left.

In order to update the register, we try to seize all opportunities we can. As we maintain continuous relations with the players of the sector, we can have access to special registers, too. Such ones are the registers kept at ministerial departments, containing information about supported organisations; the list of organisations gained 1 percent tax designation run by the Hungarian Tax and Financial Control Administration; the National Civil Fund's register about applicant organisations; the data on the member organisations of umbrella organisations; and the registers of local governments on nonprofit organisations that are operating in the area and in connection with the local governments. If necessary, we ask the individual organisations to provide or correct themselves the missing or incorrect data.

The register of the Hungarian Central Statistical Office updated in the foregoing way contains a smaller number of organisations than the court register. Therefore it is also closer to the real value. In order to illustrate the differences, here are the numbers of organisations for 2007 present in the different registers: the court register counts over 80 thousand, while the HCSO register only 60 thousand organisations. It is then implicitly assumed that the court register gives a picture of not only the actually operating but also the already dissolved organisations. In the publications using the HCSO database – such as the annually published volumes of the series entitled "Nonprofit Organisations in Hungary" (*Nagy–Sebestény–Szabó* [2007, 2008]) and

the studies summarising the results of the supplementary data collection focusing on different subfields of the nonprofit sector every year – we only include the data of organisations which fulfil the descriptions of the statistical definition and about the cessation or suspension of the operation of which we did not receive any indication from any source.

Here we need to mention the fact that the nonprofit organisations in the register are classified according to the codes of activity groups. This categorisation is called NCNPO (National Classification of Nonprofit Organisations) and applied by adapting the internationally used classification system (International Classification of Nonprofit Organisations – ICNPO) developed by the Johns Hopkins Comparative Nonprofit Sector Project. NCNPO is in parts more detailed and tailored to Hungarian special characteristics. It enables us to group the organisations according to their main activity into 18 main groups, 62 groups and nearly 200 subgroups by using the information provided in the process of their registration and statistical surveys. This system, on the one hand, enables the easier processing of data that allows detailed and international comparisons. On the other hand, it permits a search covering several groups of activities, as well as other selection criteria (such as youth organisations, and organisations dealing with the disadvantaged).

6.2. The phases of data processing

In order to get an insight into the actual activities, economic importance and financial characteristics of the sector, the first comprehensive statistical data collection was conducted – as an experiment – in 1993 on the year of 1992. Based on the experiences, both the structure of the distributed questionnaires and the method of data processing were changed significantly in 1994. At present, we still use the procedure of *data collection*, which was introduced then and which remained, apart from minor modifications and supplementations, almost the same. The questionnaire – besides the register type of information – requests data in connection with the establishment of the organisation, its members and employees, its activities, the organisation's revenues and expenditures, the grants offered, and the major financial balance sheet items.

During the *data recording process* we send questionnaires by post to all nonprofit organisations on our mailing list. Besides, the questionnaire is available on the webpage of our office and can be sent back through e-mail, too.

Data processing takes place in two phases. First we check and correct the respondent organisations' data then we form a comprehensive database. During the *correction phase* we have to face the methodological problem of how to deal with the questionnaires if the revenue and expenditure tables are empty. Although the number of these respondents is not large compared to all of the respondents, we have

no information about whether these organisations really do not have any revenues in the given year or they simply did not answer the question. Since the majority of this group comprises organisations that may possibly not have any revenues and due to their size this "withheld" amount cannot be significant, we interpret the missing amount as zero.

During *data correction* the high proportion of "other revenues" – the rate of which was initially approximately 10 percent in the 1990s – poses many problems, it can distort the picture on the revenue side to a great extent. In order to avoid this difficulty, specification of "other revenues" is asked in the questionnaire, and based on the answers we ourselves can perform the classification and identify the financial sources in retrospect.

We also come across some obstacles when we estimate the number of members of associations and advocacy groups. These organisations are supposed to have members but they do not always have precise records concerning their membership. Thus, during the data correction phase, we compute the number of members of those that do not provide us with precise membership information by taking the mean average figures of data providing organisations of similar kind and size. Another typical problem is that organisations usually overestimate the number of their members, so the data we are supplied with tend to show an "exaggerated" image. Thus, we have to undertake the task of correcting the extraordinary data, too.

Regarding the number of employees, there are three questions in the questionnaire: we ask for the number of employees working in main job full time/ main job part-time/ non-main job. On the basis of this, we calculate the full-time equivalent employment (FTE), which was introduced by the Johns Hopkins Comparative Nonprofit Sector Project and is commonly used in the international nonprofit literature. We get this figure by adding the number of employees working in their full-time main job to the half of the employees employed in part-time main job and the one-tenth of the employees in non-main job. This indicator shows how many employees in full-time main job would be equivalent to the number of people employed by the organisations in various ways.

To estimate how many full time paid employees' work is equivalent to the volunteers' performance, similar methods are used. By multiplying this index with the annual mean wages paid to the recorded main job employees in the nonprofit sector, we get the estimated wage savings, namely the rate to which the not paid wages increase the organisations' financial resources.

Before calculating the statistical indicators characterising the entire sector, there is a need to *make the database comprehensive*. The starting point for this is the information available in the computer register of nonprofit organisations, even of those that are non-respondent organisations. For the purpose of making the data comprehensive, initially, we used the system of multipliers connected to the respondent or-

ganisations, but later we developed a hot-deck imputation method, the so-called donor-finder program. The principle of this latter one is that the missing statistical data of all non-respondent organisations that have major characteristics known from the register are taken from another respondent organisation that is similar in terms of its major characteristics.

In the donor-finder program the organisations are first classified into groups according to their legal forms, activities and the location of their seats. Within all the activities we differentiate between foundations, associations, public benefit companies/nonprofit enterprises and institutions operating in the capital, county seats, other towns or villages. When separating the activities, we use the most detailed grouping possible, we do not only differentiate between main groups but in many cases also between subgroups, or we make a distinction between the categories of NCNPO. A detailed classification like this is necessary because it greatly influences the size and income structure of an organisation. (For instance, the cultural foundations operating in the capital use much greater financial resources and receive a larger amount of state support than an average village fire fighting association. Public benefit companies, unlike other organisations, mainly perform business activities and they usually have a relatively large capital. Student sports organisations with their comparatively high number of members, operating beside educational institutions, or technical sports clubs require large capital and thus stand out from among sports associations.)

When forming the groups, we assume that the average size of the non-respondent organisations with the same organisational structure and like activities, operating in a closely similar type of community is the same as that of the respondents. The differences may largely be defined by the various social, economic and demographic characteristics of geographical areas and settlements. Starting from this point, for each non-respondent organisation we attempt to find a nearest located corresponding respondent organisation (a donor) with the same group-forming descriptions, the characteristic conditions of the seat of which are most similar to those of the non-respondent organisation.

Thus, the composed database contains not only the records of respondent organisations but also those of non-respondents. In these so-called "fictitious" records, besides the basic data of organisations present in the register, all the missing information "borrowed" from the representative organisation is available. The number of potentially representative (respondent) organisations is generally double of the non-respondent ones; about fifty percent of them do not represent any other organisation, and the decisive majority of those that do represent only one organisation. The foregoing methodology used for collecting data on the period 1993–2007[4] enables us to

[4] Except 2001 and 2002, when as an experiment, sample surveys were carried out embracing only about one third of the sector.

prepare more detailed analyses reflecting reality in a more reliable way both at the regional and county level.

The results of the data collection covering the entire nonprofit sector are published regularly. In the annual publications ample table material is available for further analyses, and the information collected in a more or less unchanged structure provides an opportunity for presenting the various indexes broken down to timelines. In the following part, we give an outline of the key changes taken place in the sector between 1993 and 2006[5] together with the tendencies we can infer from them.

7. The characteristics of the sector

Not only the size and composition but also the activity structure of the nonprofit sector has fundamentally changed since 1989. Its structure has become nearly balanced and its functions have gradually strengthened. In order to map this development, we present the changes of the most important indicators in the following section.

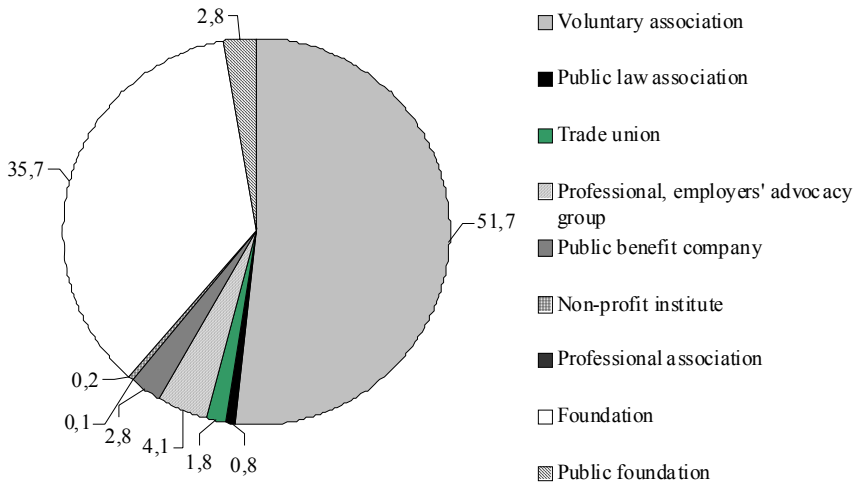
7. 1. The growth and structure of the nonprofit sector

A 1989 statistical survey found about 8 500 voluntary associations (*KSH* [1990]). The number of foundations was about 400 in the same year. At that time the Hungarian third sector was much smaller than that of developed countries. After 1989 the nonprofit organisations (NPOs) mushroomed, their social importance and economic strength soared. Starting from an absolute dominance of membership organisations, by now, only half of the NPOs are voluntary associations and roughly 36 percent are foundations. The share of advocacy organisations is only about 7 percent. The state-controlled public foundations and public benefit companies altogether account for only around 6 percent of the sector.

In the case of membership organisations, the establishment rush lasted until about 1995, which was followed by a period of stagnation and then the last 5 years of the examined period saw a slow increase. From 1990 to 1994 a large number of private foundations were established too, even if their endowments were usually very small. Then this growth slowed down.

[5] Data referring to 2007 are still under processing, so the latest available information is from 2006.

Figure 2. The composition of the nonprofit sector by organisation type, 2006



During the years, the activity structure of NPOs has also changed gradually. Those engaged in health care, education and research, economic development and social care are characterised by a dynamic and rapid growth throughout the whole period. A slowing growth is visible in the fields of culture, environment, sports and recreation, international relations, and nonprofit federations. However, the number of economic and professional advocacy organisations and voluntary fire brigades decreased.

It is essential to mention that the composition of the sphere of foundations and associations differ fundamentally as far as the activities are concerned. The fields, which were definitely underdeveloped in Hungary compared to the developed, democratic countries, represented much higher shares in the foundations sector than among voluntary associations. The most striking difference was the relatively low share of Hungarian voluntary organisations in welfare services, which are/were the most important fields of voluntary activities in developed countries. It could be explained by the state monopoly of education, social and health care under state socialism. While voluntary organisations as service providers were tolerated in culture and even promoted in sports, recreation and emergency prevention, they were not allowed to establish schools or hospitals.

Recently the structure has become more balanced. The largest number of civil organisations is engaged in sports and recreation, traditionally in the form of voluntary associations. Many nonprofit associations can be classified within arts and culture, too. The field of education and health is characterised by the dominance of founda-

tions. The smallest groups of the Hungarian nonprofit sector are the politics, multi-purpose grant-making and nonprofit unions.

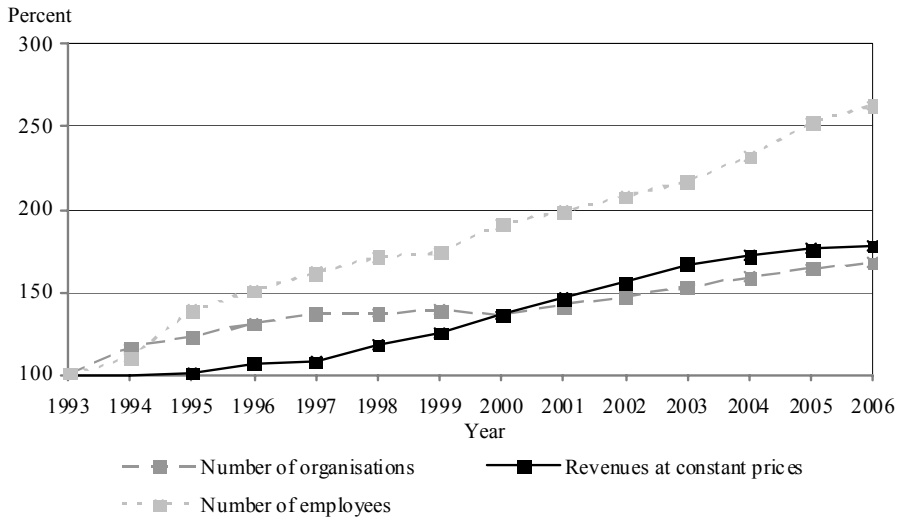
7.2. The features that characterise the sector's financing

In the entire period of time examined, the two most important indexes that reflect the development of the sector are the number of nonprofit organisations and the real value of revenues. Between 1993 and 2006 the previous one increased by 68 percent, the latter by 78 percent, but their growth curves showed major differences.

Until 1997, the number of organisations grew steadily (partly due to the establishment rush mentioned previously), after that it stagnated, then fell. From 2000 their number started to increase again.

The revenues at constant prices within the first years described a slight decrease, and then a very slow increase took place followed by a more dynamic rise only after 1997. This rate of progress has lessened since 2003.

Figure 3. The development of the nonprofit sector, 1993–2006



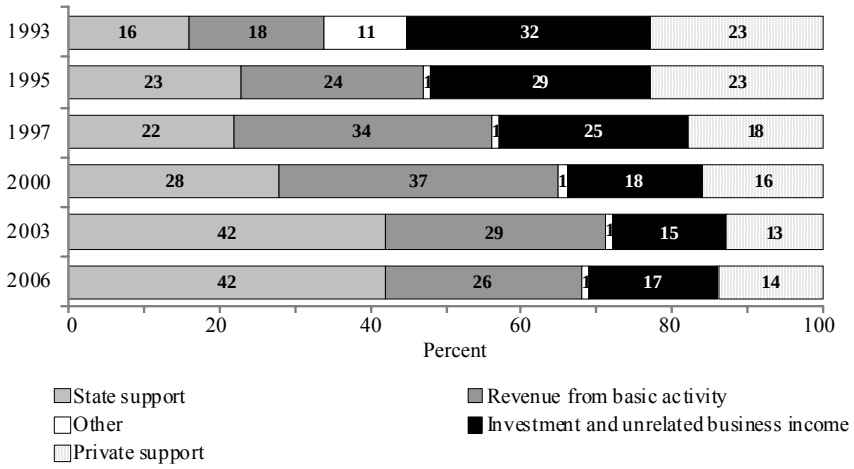
The revenue of the nonprofit sector was about HUF 896 billion (EUR 3 584 000) in 2006. (See Table 9 of Appendix.) This sum came from four major sources. In 1993, nearly 55 percent of the total revenues derived from investment, unrelated business and private donations. (See Figure 4.) By 2006 the former ratio had changed, around 68 percent of the total income came from revenues from the basic activity and state support.

The rate of state support after a long period of virtual stagnation began to increase from 1999 and reached 42 percent. The first impetus was given to increase its degree when the forms of public foundations and public benefit companies were introduced in 1994. Together with the increasing state subsidies, the sector's roles in the redistribution and in the provision of welfare services strengthened. According to the aim of their establishment carried out within a few years, public foundations play a major role in financial support, while public benefit companies realise a large share of investments. Nowadays the number and the role of these types of nonprofit organisations are continuously decreasing, but they still managed the 47 percent of the money flowing into the sector in 2006.

Two different financing schemes have been developed, the 1 percent system[6] and the National Civil Fund to ensure that a large number of civil organisations have access to support from the central budget. Since 1997, the number of civil organisations supported from 1 percent of the budget has doubled. The National Civil Fund established in 2004 receives the same amount of money from the government budget as the taxpayers offered in the previous year.

Between 1993 and 2006, the rate of revenues from the basic activity grew from 18.4 percent to 26.3 percent. This indicates that the effort of NPOs to get revenues from basic activities has been quite successful and they are able to satisfy the demands of their members and clients more and more.

Figure 4. The distribution of the revenues of nonprofit organisations by source, 1993–2006



[6] The "1 percent" law adopted in 1996 and valid from 1997 permits that taxpayers transfer 1 percent of their personal income tax to a nonprofit organisation of their choice. In 2006, 27 426 organisations received 1 percent designated funds from tax payers totalling to the amount of HUF 8.2 billion (EUR 33 000 000).

The share of private donations was about 14 percent in 2006. This low rate[7] shows that the fund raising activities of nonprofit organisations are not too successful. Therefore civil organisations should try to collect more donations and build good relations with their potential donors.

The unrelated business income and investments are less significant, but they still amount to one sixth of the earned income.

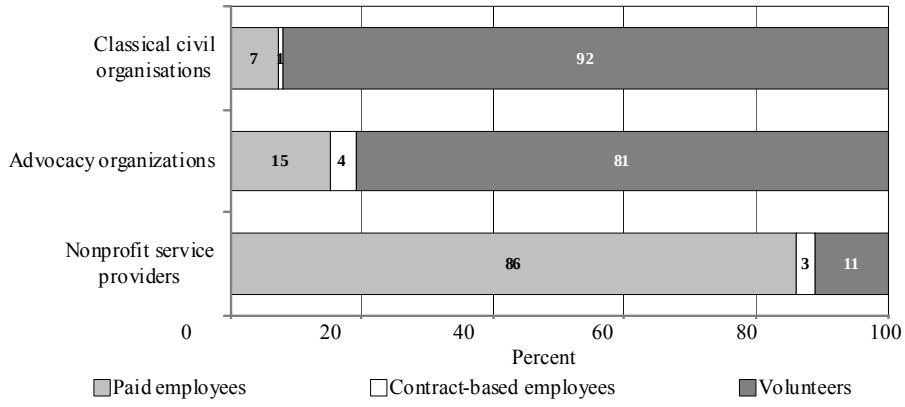
Studying the territorial distribution of the revenues of the nonprofit sector it can be stated that the major part of revenues is still concentrated in Budapest. (See Tables 4 and 8 of Appendix.) Although its extent decreased somewhat compared to that of 1993 when 28.2 percent of the nonprofit organisations operated in the capital (where one-fourth of the population lives) and 71.1 percent of the total revenue was channelled there. The same two ratios in the year of 2006 were "only" 23.8 and 59.8 percent, which can be still considered a bit high.

A further problem arises from the fact that in the sector there is an extremely large proportion of organisations with small revenue. In 2006, four fifths of the organisations had annual revenues less than HUF 5 million.

7.3. The employees, volunteers and members of nonprofit organisations

More than half a million people were active in the Hungarian nonprofit sector in 2006. In the last 15 years the number of paid employees grew steadily (see Figure 3), but nowadays only 75 000 people work full-time, though this is almost double the figure of that recorded in 1993.

Figure 5. The composition of human resources by organisation type, 2006



[7] Which is considered quite high in international comparison.

In 2006, only about 15 percent of the nonprofit organisations could afford to employ paid staff, because a low income is typical of the majority of the nonprofit sector. A cost efficient solution is also widespread: in order to avoid certain taxation and social security fees several organisations establish contracts for assignments with independent sub-contractors. Two-thirds of the paid employees worked at organisations, which are located in the capital or in county towns. Since only a very few organisations have well-trained and well-paid employees, the need for professionalisation is an important challenge for them.

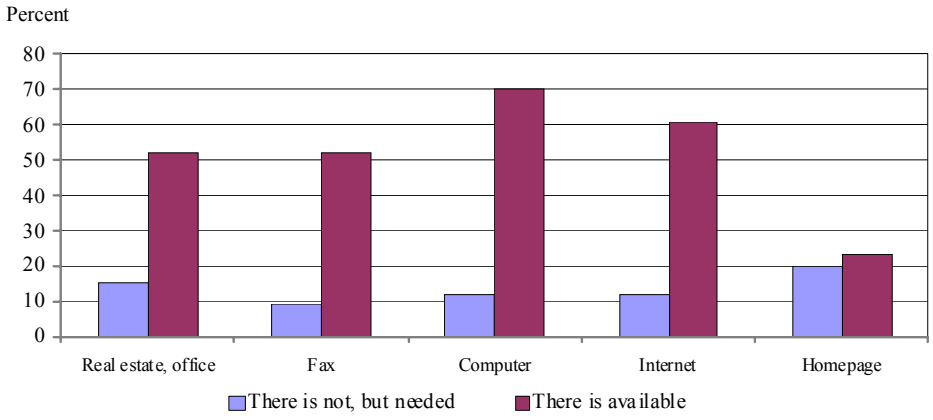
Volunteers play an important role especially in the life of small organisations and in smaller settlements, and they serve as the main form of individual support for these organisations. The number of volunteers was 438 000 in 2006. The nearly 50 million working hours that they provided is equivalent to approximately 24 thousand full-time employees. The value of voluntary work exceeded HUF 42 billion. More than 94 percent of the volunteers were active in associations and foundations, making voluntary input very important for the classical civil organisations.

The number of members in nonprofit organisations generally decreased in the examined period of time. Despite this fact, associations register over 3.7 million members, while the number of advocacy group members exceeds 1 million.

7.4. The infrastructure of the nonprofit sector

In 2006, more than half of the nonprofit sector was in possession of some kind of real estate or office. One third of the organisations did not claim to need an office. Around 30 000 NPOs occupied real estates, the largest proportion of them used the buildings/offices for free, around 20 percent rented their offices, and only 13 percent were owners.

Figure 6. The infrastructure of the nonprofit sector, 2006



In relation to the access of nonprofit organisations to communication and information technology, we examined which of the four basic tools (fax, computer, internet, homepage) were available for them. Computer availability is assured in some way for 70 percent of the sector. Most organisations can access the internet, though a significant number, around one eighth of them have no such access. More than one fifth of the organisations in the sector have their own homepage, and a further 20 percent would like to appear on websites. However, every fourth civil organisation stated that they were not able to get any kind of communication facilities.

*

During the observed period of one and a half decades, the service provider function of the nonprofit sector gradually strengthened and the organisations took over a widening range of public tasks, which belonged traditionally to the state. As a consequence of these changes, the increasing direct and indirect governmental supports to NPOs have been playing an increasingly important role in financing these public benefit activities. Summing it up, we declare that the Hungarian nonprofit sector is on the way towards the Western European type of modern civil society.

Appendix

Table A 1

The number of nonprofit organisations between 1862 and 2006

Year	Foundations	Membership organi-sations	*Total*
1862*	..	319	..
1878**	..	1 917	..
1932	..	14 365	..
1970	–	8 886	*8 886*
1982	–	6 570	*6 570*
1989	400	8 396	*8 796*
1990	1 865	14 080	*15 945*
1991	6 182	17 869	*24 051*
1992	9 703	20 660	*30 363*
1993	11 884	22 778	*34 662*
1994 ***	14 216	25 943	*40 159*
1995	15 650	27 133	*42 783*
1996	17 109	28 207	*45 316*
1997	18 603	28 762	*47 365*
1998	19 225	28 159	*47 384*
1999	19 754	28 417	*48 171*
2000	19 700	27 444	*47 144*
2003	21 216	31 806	*53 022*
2004	21 817	33 380	*55 197*
2005	22 255	34 439	*56 694*
2006	22 464	35 778	*58 242*

* The number of associations operated within the present country borders. In total 579 associations were in operation within the country borders at that time.

** The number of associations operated within the present country borders. In total 3995 associations were in operation within the country borders at that time.

*** Since 1994, the number of foundations has included public foundations and in the number of corporate nonprofit organisations public bodies and public benefit companies have also been included.

Note. 8514 associations were found in total during the association registration process for the year 1989 conducted by the HCSO in 1990 *(KSH* [1990]). This data is close to the registered number of organisations. The difference probably derives from the fact that during the statistical data collection, procedure questionnaires also arrived from organisations that were not independent legal entities, and therefore they were not included in the computer records.

Sources: Hunfalvy [1862a], [1862b]; *Vargha* [1880]; *Dobrovits* [1935 pp. 26-27]; *KSH* [1972], [1984]; for the period 1989–2006 HCSO database.

Table A 2

The percentage distribution of nonprofit organisations by organisation form, 1993–2006
(percent)

Organisation form	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Foundation	34.3	35.5	37.5	39.3	37.3	35.7
Public foundation	–	1.1	1.8	2.5	2.7	2.8
Voluntary association	53.0	53.3	52.3	47.6	49.9	51.7
Public law association	–	0.6	1.0	1.0	0.9	0.8
Trade union	5.6	4.8	3.5	2.7	2.2	1.8
Employers' advocacy group	2.1	4.2	2.7	4.9	4.6	4.1
Public benefit company	–	0.4	1.1	1.9	2.3	2.8
Nonprofit institute	–	0.1	0.1	0.1	0.1	0.1
Professional association	–	–	–	–	–	0.2
Other, unknown	5.0	–	–	–	–	–
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 3

The percentage distribution of nonprofit organisations by organisation type, 1993–2006
(percent)

Organisation type	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Classical civil organisation	87.3	88.8	89.8	86.9	87.2	87.3
Advocacy organisation	7.7	9.6	7.2	8.6	7.7	7.0
Other nonprofit organisation	5.0	1.6	3.0	4.5	5.1	5.7
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 4

The percentage distribution of nonprofit organisations by community type, 1993–2006
(percent)

Community type	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Capital	28.2	27.4	26.6	26.1	25.4	23.8
County seats	22.4	23.1	23.3	22.4	22.4	22.1
Other towns	22.5	23.6	23.9	26.1	27.1	28.9
Villages	26.9	25.9	26.2	25.4	25.1	25.2
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 5

The percentage distribution of nonprofit organisations by field of activity, 1993–2006
(percent)

Field of activity	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Culture	10.2	10.1	9.8	10.5	10.8	11.2
Religion	1.5	2.3	2.5	2.7	2.7	2.5
Sports	21.8	16.6	15.1	13.7	13.2	12.3
Recreation and hobby	12.7	16.5	16.8	15.4	15.9	16.9
Education	9.6	10.8	12.4	14.6	14.3	13.9
Research	2.1	2.1	2.2	2.2	2.2	2.0
Health care	3.7	4.1	4.4	4.5	4.6	4.7
Social services	8.0	7.4	8.2	8.8	8.6	8.8
Emergency and relief	3.6	2.7	2.3	1.9	1.6	1.5
Environmental protection	2.1	2.1	2.1	2.2	2.4	2.4
Community development	3.1	3.5	4.1	5.1	5.7	6.2
Economic development	1.8	1.3	1.5	1.9	1.9	2.2
Protection of rights	1.5	1.2	1.2	1.2	1.3	1.4
Protection of public safety	2.2	2.5	2.8	3.0	3.2	3.4
Multipurpose grant-making	1.1	1.6	1.5	1.5	1.5	1.3
International relations	1.5	1.4	1.4	1.4	1.4	1.4
Professional economic advocacy	12.1	12.7	10.8	8.7	7.8	7.0
Politics	0.9	1.1	0.9	0.7	0.9	0.9
Other, unknown	0.5	–	–	–	–	–
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 6

Revenues of nonprofit organisations by organisation form, 1993–2006
(HUF million)

Organisation form	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Foundation	52 938.2	63 750.6	86 380.0	133 311.2	157 269.4	202 879.0
Public foundation	–	15 371.1	31 198.6	54 367.5	77 495.4	85 009.5
Voluntary association	42 969.7	65 023.4	89 905.0	104 716.6	149 780.4	169 011.6
Public law association	–	6 431.1	11 407.6	15 540.4	16 394.1	21 196.1
Trade union	6 669.4	9 088.2	7 093.8	8 679.3	10 787.5	13 163.6
Employers' advocacy group	7 319.5	10 959.3	7 521.2	46 635.5	72 711.8	53 383.9
Public benefit company	–	8 045.7	46 728.1	125 721.9	235 815.3	336 543.4
Nonprofit institute	–	3 246.9	4 127.9	6 535.6	10 799.7	7 572.4
Professional association	–	–	–	–	–	7 484.6
Other, unknown	8 578.6	–	–	–	–	–
Total	*118 475.4*	*181 916.3*	*284 362.2*	*495 508.0*	*731 053.6*	*896 244.1*

Table A 7

The percentage distribution of the revenues of nonprofit organisations by organisation form, 1993–2006
(percent)

Organisation form	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Foundation	44.7	35.1	30.4	26.9	21.5	22.6
Public foundation	–	8.4	11.0	11.0	10.6	9.5
Voluntary association	36.3	35.8	31.6	21.1	20.5	18.9
Public law association	–	3.5	4.0	3.1	2.2	2.4
Trade union	5.6	5.0	2.5	1.8	1.5	1.5
Employers' advocacy group	6.2	6.0	2.6	9.4	9.9	6.0
Public benefit company	–	4.4	16.4	25.4	32.3	37.5
Nonprofit institute	–	1.8	1.5	1.3	1.5	0.8
Professional association	–	–	–	–	–	0.8
Other, unknown	7.2	–	–	–	–	–
Total	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 8

The percentage distribution of the revenues of nonprofit organisations by community type, 1993–2006
(percent)

Community type	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Capital	71.1	65.5	61.8	62.8	61.3	59.8
County seats	13.9	18.3	22.2	19.4	18.3	16.2
Other towns	9.5	9.2	9.8	11.4	13.2	17.2
Villages	5.5	7.0	6.2	6.4	7.2	6.8
Total	*100.0*	*100.0.*	*100.0*	*100.0*	*100.0*	*100.0*

Table A 9

Revenues of nonprofit organisations by source, 1993–2006
(HUF million)

Source of revenue	1993.	1995.	1997.	2000.	2003.	2006.
	year					
State support	19 440.6	40 911.4	63 329.3	140 917.4	308 964.0	378 353.7
Private support	26 764.6	42 492.6	51 942.3	79 993.0	95 117.6	126 466.2
Revenue from basic activity	21 730.6	44 275.3	95 490.1	183 105.5	210 740.9	235 820.0
Investment and unrelated business income	37 945.7	52 097.6	69 922.1	87 558.4	110 590.0	147 331.6
Other	12 593.9	2 139.4	3 678.4	3 933.7	5 641.1	8 272.6
Total	*118 475.4*	*181 916.3*	*284 362.2*	*495 508.0*	*731 053.6*	*896 244.1*

Table A 10

The number of the employees of nonprofit organisations, 1993–2006

Employee	1993.	1995.	1997.	2000.	2003.	2006.
	year					
Main job – full time	30 234	41 289	47 709	56 004	63 302	75 413
Main job – part time	1 564	3 363	5 770	10 100	12 765	20 035
Non-main job	16 327	25 037	22 344	14 676	11 204	4 212
Total	*48 125*	*69 689*	*75 823*	*80 780*	*87 271*	*99 660*
Within this FTE employees	**32 649**	**45 475**	**52 828**	**62 522**	**70 805**	**85 852**

The authors' other relevant tables are accessible from the HCSO's homepage: www.ksh.hu/statszemle.

References

BALOGH, B. – MÉSZÁROS, G. – SEBESTÉNY, I. [2003]: *10 Years in Nonprofit Statistics, 1992–2002*. Központi Statisztikai Hivatal. Budapest.

BOCZ, J. [1992]: Egyesületi statisztika Magyarországon. *Statisztikai Szemle*. 70. évf. 10. sz. pp. 840–852.

DOBROVITS, S. [1935]: Magyarország egyesületeinek statisztikája. *Magyar Statisztikai Szemle*. 13. évf. 1. sz. pp. 23–27.

DOBROVITS, S. [1936]: *Budapest egyesületei.* Statisztikai Közlemények. 3. sz. Budapest Székesfőváros Statisztikai Hivatala. Budapest.

DOBROVITS, S. [1938]: Társadalmi szervezetek. *Magyar Statisztikai Szemle*. 16. évf. 4. sz. pp. 414–418.

DOMOKOS, A. [1968]: A társadalmi egyesületek statisztikája. In: *A magyar hivatalos statisztika történetéből. Az V. Statisztikatörténeti vándorülés előadásai és korreferátumai (Gödöllő. 1967. május 23–25.).* Magyar Közgazdasági Társaság Statisztikai Szakosztály Statisztikatörténeti Szakcsoport. Budapest. pp. 220–229.

HUNFALVY, J. (ed.) [1862a]: Magyarország különböző egyletei. *Statistikai Közlemények.* IV. köt. I. füzet. Magyar Tudományos Akadémia Statistikai Bizottsága. Pest.

HUNFALVY, J. (ed.) [1862b]: A hazai állapotok ismeretének előmozdítására. (1862). *Statistikai Közlemények* I. köt. 4. füzet. Magyar Tudományos Akadémia Statistikai Bizottsága. Pest. pp. 246–269.

KSH [1972]: *Egyesületek Magyarországon, 1970.* Budapest.

KSH [1984]: *Egyesületek Magyarországon, 1982.* Budapest.

KSH [1990]: *Egyesületek Magyarországon, 1989.* Budapest.

KSH [1993]: *Társadalmi szervezetek 1991-ben Magyarországon*. Budapest.

KUTI, É. [2008]: *Civil Európa. Civil Magyarország*. Európa Ház. Budapest.

NAGY, R. – SEBESTÉNY, I. – SZABÓ, I. [2007, 2008]: *Nonprofit szervezetek Magyarországon, 2005, 2006.* Központi Statisztikai Hivatal. Budapest.

REISZ, L. [1988]: Egyletek a dualizmuskori Magyarországon. *Statisztikai Szemle*. 65. évf. 10. sz. pp. 930–646.

SALAMON, L. M. – ANHEIER, H. K. [1995]: *Szektor születik*. Nonprofit Kutatócsoport. Budapest.

SALAMON, L. M. – ANHEIER, H. K. [1999]: *Szektor születik II*. Civitalis Egyesület. Budapest.

SALAMON, L. M. ET AL. [1999]: *Global Civil Society.* Dimensions of the Nonprofit Sector – The Johns Hopkins Center for Civil Society Studies. Baltimore.

SALAMON, L. M. – SOKOLOWSKI, W. S. – LIST, R. [2003]: *A civil társadalom "Világnézetben"*. Civitalis Egyesület. Budapest.

SEBESTÉNY, I. [2001]: A magyar nonprofit szektor nemzetközi és funkcionális megközelítésben. *Statisztikai Szemle*. 79. évf. 4–5. sz. pp. 335–373.

SEBESTÉNY, I. [2003]: Az egyesületek számbavételének módszertani problémái a történeti statisztikában. *Statisztikai Szemle*. 81. évf. 4. sz. pp. 373–387.

VARGHA, GY. (ed.) [1880]: *Magyarország egyletei és társulatai 1878-ban.* Hivatalos Statisztikai Közlemények. Országos Magyar Királyi Statisztikai Hivatal. Budapest.

Main Features of Epidemiological Development in Hungary after the Second World War*

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There have been three periods of epidemiological development in Hungary since the end of the Second World War: the hopeful beginnings between 1948 and 1966, the chronic, qualified epidemiological crisis from 1967 to 1993, and the period of renewal since 1994. In the first period, life expectancy increased by 8.5 years, in the second period it became 0.8 years shorter, but for the male population, 2.7 years shorter. In the last thirteen years, life expectancy has lengthened by 4.1 years. In six decades, the age and the cause structure of mortality have changed substantially. In 1947, 48 percent of total deaths were among the over-sixties; in 2006 this figure was 78 percent. In the same period, the proportion of deaths from infectious diseases went down from 11.8 to 0.6 percent; from cardiovascular diseases, up from 22.9 to 50.6 percent; and from cancers, up from 9.5 to 24.6 percent. The secular trend of mortality – general, age-specific and cause-specific – to a large extent was badly influenced by the two fundamental changes in socioeconomic and political structure experienced by the country in a historically short period. The improvement since the transition will only be sustainable if today's large geographical differences in mortality – the result of the social, rather than the physical environment – are reduced.

KEYWORDS:
Differential mortality.
Epidemiology.

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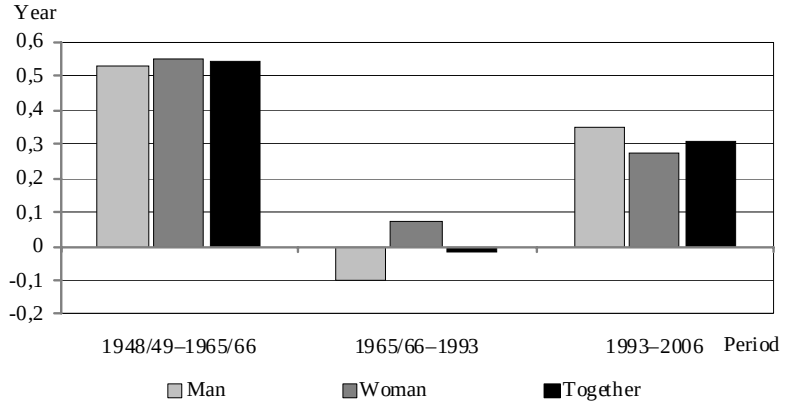
Epidemiological conditions (morbidity, mortality and life expectancy) changed more in the decades following the Second World War than in the centuries that preceded it, a statement which is as true for Hungary as for the world as a whole. What makes Hungary different, however, is that the continuity of epidemiological development was broken by a violent transformation of society. From the mid-1960s onwards, the satellite countries east of the Elbe fell behind the Western European countries in terms of mortality and life expectancy. In Hungary, a *chronic, qualified epidemiological crisis* set in and was deepened by the shockwaves of the political transition in the early 1990s. Life expectancies were worse in 1993 than in 1966. The turning point came in 1994, and in the following thirteen years life expectancy at birth lengthened by 4.1 years as Hungary started to catch up with the countries forming the core of the European Union.[1] It will take another ten-fifteen years to reach the life expectancy prevalent at present in the EU.

Epidemiological development in the six decades following the war may be divided into three periods: the hopeful start between 1948 and 1966, the chronic, qualified epidemiological crisis between 1967 and 1993, and the period of renewal starting in 1994. Figure 1 shows the annual average change in life expectancies for men, women and the total population in the three post-war periods of epidemiological development. The divergent patterns of life expectancy in each period show up markedly.

Figure 1. Annual average change in life expectancy at birth in the three periods of post-Second World War epidemiological development



[1] Countries which were EU members before May 2004, namely Austria, Belgium, Denmark, Finland, France, Greece, the Netherlands, Ireland, Luxembourg, the United Kingdom, Germany, Italy, Portugal, Spain, Sweden.

1. The hopeful beginnings: 1948–1966

The population of the country – in mortality terms – had recovered from the destruction of war by 1947. After the extremely high number and rate of deaths in 1944 and 1945, fewer people died in 1947 than in 1943. In fact, 1947 was the first year in the seventy-year history of registration of deaths in which the death rate fell below 13 per thousand. Life expectancy in 1948/49 approached 61 years, 4.4 years higher than in 1941.

The healthy trend continued up to the mid-1960s: mortality greatly improved, as expressed in both the number and the rate of deaths. In the decade up to 1944, an average of a hundred and thirty thousand people died each year representing a crude mortality rate of 14.1 per thousand, compared with annual averages of a hundred and five thousand or 10.8 per thousand between 1947 and 1966. Proof of the consistency of the secular trend is that the death rate of 12.9 per thousand at the start of the two-decade period fell to 10.0 by 1966. Progress was greatest in infant mortality: there were twenty thousand infant deaths in 1947, 106.6 per thousand live births, a rate which went down to 38.4 in 1966. Life expectancy also improved: the generation born in 1948/49 had a life expectancy of 60.9 years, a figure which rose to 69.6 by 1965/66. A striking feature of life expectancy improvement was its almost exclusive confinement to infancy and young adulthood; another was the almost equal improvement for men and women. Nota bene: a key development for later epidemiological development was that male life expectancy peaked at 67.3 years in 1965/66, an almost unbroken upward trend of seven decades.

Most of the reduction in mortality and the increase in life expectancy derived from fundamental changes in the effectiveness of health care, although living conditions, mainly better nutrition, no doubt also played a part. In the first two decades after the war there was a revolutionary improvement in both preventive and therapeutic medicine. Vaccinations and better public health conditions led to the complete eradication of some infectious diseases and the diminution to an insignificant level of the mortality due to others. There were particular successes in diseases affecting infants and children, such as diphtheria and poliomyelitis. Antibiotics caused a rapid decline in mortality from two frequently fatal diseases, pneumonia and tuberculosis. Penicillin also proved an effective treatment for many previously-lethal infectious diseases besides pneumonia. The overall result was a transformation of the mortality structure. In 1947, infectious diseases accounted for a third of all deaths; by 1966, this had fallen to a tenth. The complementary phenomenon in the new structure was the substantial rise in the number of deaths from cardiovascular diseases and cancer. The former increased from 22.9 to 50.5 percent of all deaths, and the latter from 9.5 to 20.1 percent. The proportion of deaths from external causes also increased. In 1966, these three main cause of death groups accounted for 77.6 percent of all deaths.

Hungary's epidemiological history in the first two post-war decades defies the usual interpretations: society went through a series of traumas which seem inconsistent with improving life expectancy. Socioeconomic success is the usual condition for health improvements, while chaotic conditions, social and economic malfunctioning – especially if these persist for a long time – are normally detrimental to health and everything which determines it, with the concomitant implications for life expectancy.

This deviation from the usual causal relationship can only be explained by the special conditions in the country which permitted epidemiological development to withstand and even profit from the violent transformation of society, in this case invasive state interference. Part of the ethos of dictatorial Communist rule was improvement of the health of the people. Where this was feasible by means of central instructions, compulsory interventions and a low level of investment, progressive public health measures could be an integral part of the "constructive function" of dictatorship. This was a feature of the optimistic decades following the takeover of power, when "mobilisation of the people" and acceleration of technical development were resources that could still be tapped. This happened in nearly every Central-Eastern European country which was "building socialism", also in China and Cuba. Life expectancy at birth increased at an unprecedented rate, especially through the reduction of infant and child mortality. Infant mortality, indeed, was at that time the most sensitive indicator of health conditions.

It should be noted that the extension of employment and social insurance to the whole population meant that every member of society had access to health care – medical treatment, medicines and, those in work to sick pay. These were major and successful advances.

2. The chronic qualified epidemiological crisis: 1967–1993

By the mid-1960s, the epidemiological transformation in Hungary was complete. The country had entered a new epidemiological regime in which three-quarters of deaths occurred over the age of 60, and three-quarters of deaths were the result of cardiovascular disease, cancer and external causes. At the start of this new phase, life expectancy at birth was approximately 70 years.

There seemed good reason at that time to hope that the effect of the country's semi-peripheral position (in terms of socio-economic development) – the lag in epidemiological development – might be eliminated. Hungarians born in these years looked forward to a living only 0.3 years less than Austrians. What happened in the

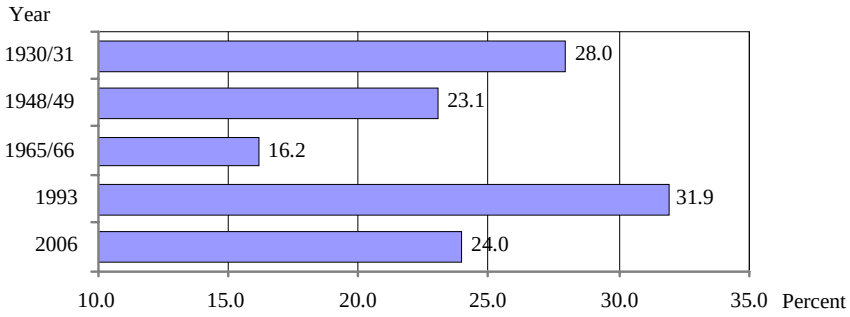
first half of the 1960s was in fact a fortunate conjunction. Life expectancy had been freed from the influence of infectious diseases and was not yet burdened by chronic diseases resulting from wear and tear of the body. To put it more precisely, in terms of worsening life expectancy, the reduction in the former obscured the increase of the latter. When the reserves deriving from reducing infectious disease mortality had run out, life expectancy, especially for men, started to decrease. This first happened in 1967. When the minor decrease in life expectancy heralded the start of the phenomenon, it could still have been put down to random variations in stochastic processes. It gradually became clear, however, that it was a sustained basic trend caused by adverse epidemiological phenomena, mainly, if not exclusively, in the middle-aged male population.

The increase in mortality was primarily related to *unhealthy lifestyle*. Deteriorating mortality mainly affected people with low levels of education – unskilled and semi-skilled workers and agricultural labourers. A strange paradox emerged. Despite the war, reconstruction, artificially forced industrialisation and the related high rate of migration among unskilled workers, the violent change of ownership in agriculture, the expropriation of private property, the systematic dismantling of the structure of society and the Stalinist terror in political affairs, with all the attendant fear, the two decades between 1947 and 1966 turned out to be one of the most successful periods of 20th century epidemiological development, while during the years of consolidation, despite the improvement of living standards and even quality of life, a chronic qualified epidemiological crisis took hold. Just as Hungary had "got out of the storm", the steadily rising mortality of apparently "new" diseases led to a death rate among men in the middle of their lives which evoked the economic crisis of 1929–32.

Between 1966 and 1993, men's life expectancy at birth decreased by 2.7 years, and women's increased by 1.8 years. The improvement among women was not enough to balance out the deterioration among men, and the life expectancy of the population as a whole decreased by 0.8 years. This was an unusual development in peacetime in a civilised European country with a developed health culture. The crisis was qualified, however. The deterioration in life expectancy did not affect the population under 30 or over 75; it had much more severe effects among the male than the female population; and mortality rose only in four of the eight most prevalent main death groups: cancer, cardiovascular diseases, diseases of the digestive system and external causes.

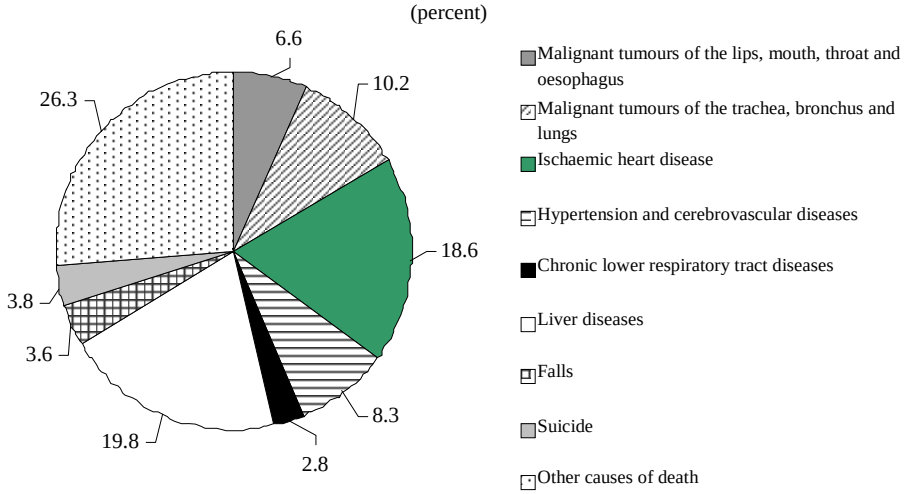
Figure 2 shows the essence of the chronic, qualified epidemiological crisis as regards the men aged between 30 and 60 years. They were the group most severely affected by the crisis. The probability of a thirty-year man not reaching his sixtieth birthday went up from 16.2 percent in 1965/66 to 31.9 percent in 1993, 3.9 percent higher than the 1930/1931 figure.

Figure 2. Male probability of dying between exact ages of 30 and 60 years
(percent)



An examination of the structure of cause of death shows which diseases and external fatal incidents grew in frequency to cause the increase in the probability of dying among men between the ages of 30 and 60. The following pie chart (see Figure 3) shows the percents with which increasing frequencies of death of the male population from certain causes contributed to the deterioration of cause-specific mortality between 1966 and 1993. Liver diseases caused nearly a fifth of the increase in probability of dying, coronary heart diseases almost the same, lung cancer about ten percent, hypertension and cerebrovascular diseases together about eight percent, and malignant tumours of the lips, mouth, throat and oesophagus between six and seven percent. These figures are for the segment of the population most affected by the epidemiological crisis.

Figure 3. Contribution of the main increasing cause specific probabilities of dying to the rise of probability of dying for male population between exact ages of 30 and 60 years, 1966–1993
(percent)



Nearly two thirds of the deterioration in mortality, therefore, derived from the increased frequency of death from cancer, cardiovascular diseases and diseases of the digestive system. The mortality in these three main causes of death groups was also largely responsible for the worsening mortality among the population as a whole.

For infectious diseases, it is easy to describe the cause of death and the mechanism of the processes leading to death: death is *monocausal* when a single agent – for example mycobacterium tuberculosis or TBC – causes the death of a person. However, most of the pathogens responsible for the above diseases or characterised as risk factors are probably of *multicausal* origin. Behind the six diseases or groups of diseases involved here are primarily not inherited factors, but unhealthy lifestyle and the social environment which largely defines it. Most liver diseases are due to the result of heavy alcohol consumption and 85–90 percent of lung cancer to cigarette smoking, while coronary heart disease is frequently related to smoking, unhealthy nutrition, obesity, lack of exercise and sustained or recurrent stress, and often involves hypertension and diabetes. Cerebrovascular disease is strongly related to high-salt and high-fat diet, and often involves hypertension and atherosclerosis. Cancers of the upper third of the digestive system, particularly of the mouth, are predominantly due to the synergistic effects of smoking and alcoholism. Personality changes caused by alcohol addiction involve neglect of health, in this case failure to care for the mouth, which is also a causal factor.

The effects of smoking and heavy drinking on the number of deaths have been effectively quantified in the hierarchy of risk factors. In Hungary, a conservative estimate puts the average annual number of deaths from smoking at 25–28 000, from alcoholism at 15–17 000, corresponding to approximately 19–21 and 11–13 percent of total mortality. At the beginning of the 20th century 36–41 thousand deaths may be attributed to the two addictions, this means 27–30 percent of all deaths. This proportion is substantially higher among middle-aged men. In the 35–64 year male age group, approximately 35 percent of deaths at the turn of the millennium and in the first years of the 21st century were the consequence of smoking, about 27 percent could be attributed to alcoholism, and about one percent was due to the combined effects of the two addictions. This means that some 63 percent of deaths among middle aged men was caused by these two addictions, or at least were substantially influenced by them. Experts agree that in industrial and postindustrial countries *smoking is the number one risk factor.* The epidemiological significance of alcohol abuse and intoxication, however, depends on drinking culture. In this respect the developed countries fall into different groups. Hungary is grouped together with the Scandinavian, and even more closely with the Slavic countries, where heavy drinking is a serious social problem, and substantially affects mortality rates, especially among men.

Alcoholism has always been a problem in Hungary, but a particular kind of drunkenness, which over several decades gave rise to one of the country's most se-

vere health and social problems, became widespread in the 1950s and 1960s in circumstances deriving partly from Soviet Russian "imports", partly from socialist industrialisation and partly from Hungary's version of Soviet-type socialist society. One aspect of this was internal migration; in the big construction projects of the 1950s, everyday heavy drinking was established as a social norm among semi-skilled and unskilled workers who, having largely been recruited from agricultural areas, moved far from their families. For these people, the primary relaxation in after-work free time was drinking in the local bar. When they travelled home every two weeks on the notorious "black trains"[2] running between the heavy-industrial construction projects and the railway stations serving remote, backward rural areas, it was again only bad-quality alcohol which was available to them in large quantities. Drunkenness did not endanger their jobs; in an aggressively downwardly-levelling society, where achievement was not highly valued, there was a generally permissive attitude to alcohol abuse. Thus it was that the first-generation Hungarian "labouring class" went from the new, socialist towns of Leninváros (Lenincity) and Sztálinváros (Stalincity) directly to an "alcoholic paradise". The legacy of the special kind of drunkenness pervading the lower reaches of society still presents a severe burden to the country as a whole. For those at the top of the social pile, the availability of publicly-funded alcohol as part of official entertainment made drinking during working hours socially acceptable. This was the "apricot-*pálinka* hazard" faced by leaders, the "cadre alcoholism". In the achievement-oriented society which took shape following the social and political transition, there are some signs, including a levelling off of alcohol consumption for many years that drunkenness is not on the increase[3]. But actually combating this widespread disease among free-market conditions is a problem which Hungarian society has yet to solve.

The question remains as to why the epidemiological crisis was predominantly a phenomenon of the adult population, featuring a high death rate among 40–59 year old men, and did not affect, for example, vulnerable infants or elderly people of declining strength. The explanation lies in the chronic nature of non-infectious diseases and the major risk factors behind them. Two simplified examples will serve as illustrations: if somebody develops an addiction to tobacco or alcohol during their teens or twenties, it usually takes another two-three decades for the first symptoms of lung cancer or liver cirrhosis to appear. Death occurs a few years after the disease manifests itself, very frequently in the fifth or sixth decade, sometimes later. For the large numbers of people who became addicts to one or other, or perhaps both, in the 1950s or 1960s, deaths from lung cancer and liver cirrhosis were very common in the

[2] This has been the nickname of run-down trains directly connecting fortnightly the workplace and junction of local homeward trains.

[3] It is difficult to estimate the per capita alcohol consumption, because a fairly large amount of alcoholic beverages is in the black market.

1970s, 1980s and later. The medical history of cardiovascular diseases is more complicated, but leads to the same outcome.

The primacy of chronic, non-infectious diseases became a major challenge for the societies of capitalist countries several decades before the same occurred in Soviet-type socialist countries. This led to the stagnation or slowing improvement of life expectancy for a while, but did not lead to an epidemiological crisis, and from the mid-1960s life expectancy resumed its upward curve. Indeed, for the first time in the several-thousand year history of epidemiology, the improvement showed up in every age group. It was the inability of the socialist countries to meet the challenge that was really behind the emergence of the chronic epidemiological crisis in Hungary.

The issues of morbidity and mortality rates, the health of the population and life expectancies go beyond mere epidemiology and public health. They form a border area par excellence, and their investigation calls on the disciplines of demography, sociology and, just as importantly, historiography.

Life expectancy has some correspondences, indeed interactions, with economic, social, political and cultural conditions, but these are indirect and complex. It is true that there is a strong correlation between per capita GDP and life expectancy at birth, but the former is not the sole determinant of the latter. Nevertheless, its semi-peripheral socio-economic situation always placed the country at the back of the pack as regards life expectancies, but this is not an argument which addresses the finding that the gap steadily widened for nearly three decades. It is also true that the collapsing communist regime was unviable, but that fact alone is not enough to explain Hungary's chronic epidemiological crisis, because there was no such crisis in other satellite communist countries before the transition.[4] There, the troubles were of smaller magnitude, or to put it another way, had not reached the crisis threshold. But the roots of the troubles were identical.

In the periodization of epidemiological regimes, the second era is that of endemic infectious diseases, and the third and fourth are those of the primacy of non-infectious diseases. The crucial difference between the last two is that in the third, preventing diseases and halting or slowing their progression is possible only to a very modest extent, whereas in the fourth a substantial fraction of degenerative diseases can be prevented and others, largely those related to ageing, may be postponed or their progression slowed. The eras are separated not by a sharp boundary, but by a transition, an evolutionary change. The epidemiological crisis was visited on Hungarian society in the third era. The unviability of the collapsing social-economic-political system was more than the chronic shortage of goods, the "inability of the oppressors to govern in the old way"[5], it was also proof that the system could not re-

[4] The epidemiological history of the newly independent states of the former Soviet Union is different.

[5] Paraphrasing *V. I. Lenin*.

spond to the challenges of the third epidemiological era. For a long time there was no assessment of the situation and no policy was drawn up. Medical capabilities were also lacking. The ethos of a low-efficiency, negligent regime was unsuitable for implementing a strategy based on *responsibility of the individual, namely health awareness*. And it was health awareness that was lacking more than anything else. There were other deficiencies, but this was probably the punctum saliens.

3. A new era in epidemiological development: mortality and life expectancies from 1994

The epidemiological crisis, as has already been mentioned, was aggravated by the shockwaves of the political and social transition. It reached its nadir in 1993, when 150 000 people died, the death rate was 14.5 per thousand and the life expectancy at birth only 69.1 years. People had not died in such numbers or at such a rate since the end of the Second World War. What is most telling, however, is that life expectancy at birth declined to the level of three decades earlier. It was at this nadir that a new era in epidemiological development started, characterised by the decrease in number and rate of deaths and the substantial, long-lasting and sustainable improvement of life expectancy. From 150 000 in 1993, the number of deaths decreased to between 132 000 and 136 000 from 2000 onwards, and the death rate decreased from 14.5 per thousand to between 13.0 and 13.5 per thousand. In the meantime, the population aged considerably.

Life expectancy of men increased from 64.5 years in 1993 to 69.0 years in 2006, and that of women from 73.8 to 77.4 years, an improvement in the population as a whole of 4.1 years, so that in 2006 the population of Hungary faced a life expectancy of 73.2 years. This is the highest figure in the hundred-year series of life expectancies, although still considerably lower than the European Union average. For the first time in the history of modern epidemiological development, life expectancy increased less for women than men. The principal factor in this outcome is that more and more women smoke, while the number of smokers among men is no longer increasing, in fact some data suggest that fewer men smoke now than one or two decades ago.

Death rates decreased considerably in every age group: from 12.5 to 5.7 per thousand among infants, and by 50 percent in the 35–39 year age-group. In general, the improvement in age-specific mortality was very high up to the ages of 50–55 and more modest among older people. The changes varied between 10 and 70 percent.

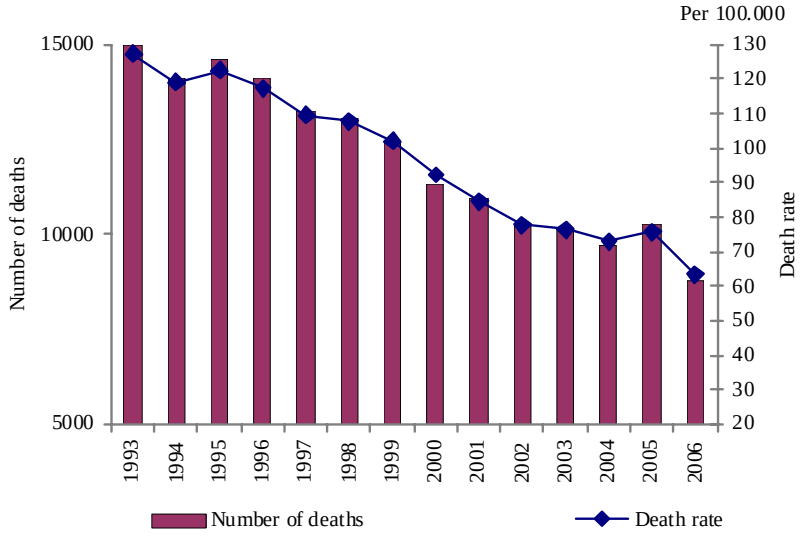
The period of renewal is a slow and gradual transition to the era of delayed progression of disease and postponement of death. It is the result of a complex set of developments dominated by the successes of preventive and curative medicine (primar-

ily in prevention and treatment of cardiovascular diseases) and perceptible changes in lifestyle (particularly nutrition) among the upper and professional upper middle classes. The conditions for these were created by the political and social transition. The capitalism – or more euphemistically market economy – which has taken shape in Hungary over nearly two decades to date, and the accompanying open society are achievement-oriented formations, and demand achievement-oriented behaviour from individuals, in which health-awareness is inherent. The new ethos of society is diffusing from the top downwards; it has still not reached that large set of people who were the losers in the transition.

The relative weight of more effective health care in the decrease of mortality has been quantified. It is measured by the number of deaths avoidable by medical intervention and their frequency. Trivial examples of such mortality are deaths from acute appendicitis and death from high blood pressure, except in old age. Mortality from such causes decreased by nearly 43 percent between 1993 and 2006 and its proportion of total mortality went down from some 22 to 16 percent. Some 40 percent of the improvement in mortality is the result of the decrease of deaths avoidable by medical intervention.

Of the 4.1 year extension of life expectancy at birth, 1.9 years were accounted for by success in treating cardiovascular diseases, primarily acute myocardial infarction, but only 0.4 years by treatment of cancer.

*Figure 4. The number of deaths from acute myocardial infarction and the standardised death rate in the period 1993–2006**



* The death rate standardised to the WHO "European population" age distribution.

The successes are understandable when the appearance of highly effective medicines, the provision of emergency care throughout almost the entire country and the now-routine nature of surgical interventions in the coronary artery system are taken into account. In the last 7 years, the numbers of various types of the latter have increased by factors of between 4 and 12 depending on type. Acute myocardial infarction is no longer a fatal disease: the number of deaths from this disease decreased from some 15 000 in 1993 to 8 800 in 2006 and the death rate per hundred thousand of population in 2006 was hardly more than a third of the 1993 figure. (See Figure 4.)

In the little more than a decade since the 1994 turning point, the country's lag in epidemiological development originated from its semi-peripheral socio-economic situation and cul-de-sac of modernisation cannot be eliminated but it can be decreased only. Life expectancy in 2006 was still 5.2 years shorter than the average of the expanded EU and about two years shorter than might be expected on the basis of per capital GDP calculated by simple regression analysis. Mortality from cardiovascular diseases is 82 percent higher in Hungary than that of the 25 countries of the EU, and mortality from cancer 31 percent higher; death from external causes is 59 percent more frequent than in the EU.[6] While there has been an epochal improvement in life expectancies, it is clear that Hungary is still at the beginning of a very long journey.

4. Social inequality of life expectancy in the recent period of epidemiological development

Reducing socially-determined differential mortality will be essential for further improvement of mortality and life expectancy. The first step to do it is to reveal where these differentials can be found. Since geographical mortality differentials in fact manifest socio-economic mortality differentials, much more than environmental ones, this kind of differentials has been studied.

A recently-completed study by the Hungarian Central Statistical Office, taking an ecological approach, analysed life expectancies by human development indicators and determined who were the winners and losers in the decade and a half since the political transition. Life expectancy at birth in the period of 2003–2006 was calculated for the 168 local administrative units-1 (LAUs-1) of Hungary and for the 23 districts of Budapest. The strength of the relationship of life expectancy at birth with per capita gross income (before taxation) and the proportion of people with higher

[6] These figures are standardised, so that the populations are of equal age distribution in the comparison.

education attainment (in the 25 years and older population) was then determined for the universe of local administrative units-1. The correlation coefficient between life expectancy at birth and per capita gross income was 0.68872, and was highly significant: $p<0.0001$. The correlation with the proportion of those with tertiary educational attainment was similarly high, its coefficient being 0.67290, $p<0.0001$.

The 168 LAUs-1 were divided into quintiles. The main findings are:

Average life expectancy in the 168 LAUs-1:

first quintile	73.9
second quintile	72.8
third quintile	72.1
fourth quintile	71.5
fifth quintile	70.6
national average	72.8 years.

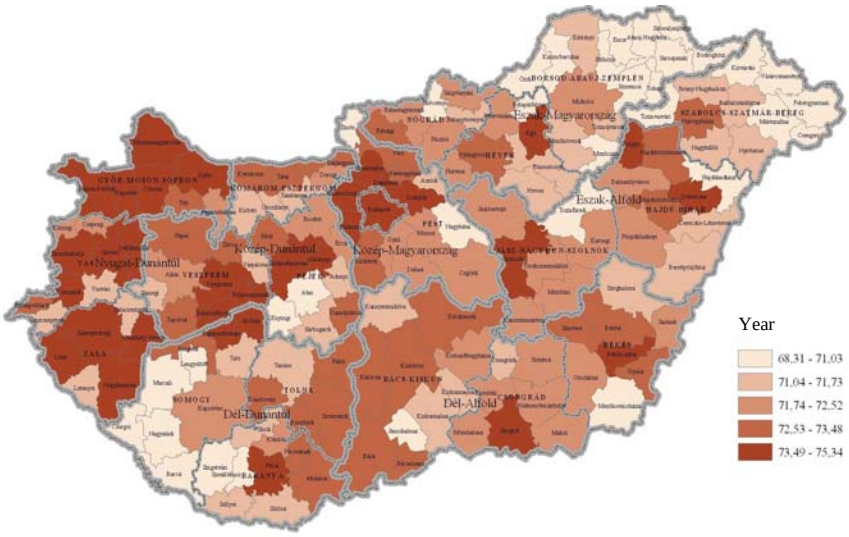
Life expectancy was longest in the Szentendre and Balatonfüred LAUs-1 (75.3 years) and shortest in the Bodrogköz LAU-1 (68.3). The difference between the longest and shortest life expectancies was 7.0 years. In the Budapest conurbation and in the resort area of the northern shore of Lake Balaton, per capita gross income was HUF 807 000 and HUF 634 000 respectively in the period of 2003–2006, while in the LAU-1 of Borsod-Abaúj-Zemplén county it was HUF 281 000. The proportion of those with tertiary educational attainment in the 25 years and over population was 20.8 and 13.7 percent respectively in the first two LAUs-1, and 3.4 percent in the third.

Life expectancies were better than the national average in thirty-four LAUs-1 (including Budapest), equal to it in thirty-three, and not as good in a hundred and one. 46.0 percent of the population live in the thirty-four LAUs-1 in which people live longest, and 18.3 percent live in the thirty-three LAUs-1 in the third quintile, where life expectancies are the same as the national average.

The remaining hundred and one LAUs-1 contain 35.8 percent of the Hungarian population. These 3.6 million people live in areas, where the improvement of life expectancies since the transition has not brought them up to the national level. This is especially true in the North Hungary and North Great Plain regions, more precisely in LAUs-1 in the counties of Borsod-Abaúj-Zemplén and Szabolcs-Szatmár-Bereg.

The cartogram of life expectancies at birth in the LAUs-1 (Figure 5) clearly shows that people who live in the LAUs-1 of the Central Hungary, West Transdanubia and Central Transdanubia regions live longer than those in the South Transdanubia, South Great Plain, North Great Plain and North Hungary regions. People living in the LAUs-1 in the Budapest conurbation, large cities and around Lake Balaton have particularly long life expectancy. Life expectancies are generally shorter in LAUs-1 with small populations.

Figure 5. Life expectancy at birth in the LAUs-1, 2003–2006



Although Budapest forms only one of the country's 168 LAUs-1, it has a population of 1.7 million, set against the average LAUs-1 population of 60 000. In the early years of the 21st century, people living in Budapest produced 36 percent of the GDP, and per capita GDP was more than twice the national average. These demographic and economic indicators combined to justify analysing Budapest as a separate observational unit and comparing life expectancies in its twenty-three districts.

There are six districts on the right bank of the Danube (Buda), with a total population of 358 000. In the seventeen districts on the left bank (Pest), the total population is 1 344 000. The six Buda districts can be found in the first three quintiles; these are calculated by decreasing life expectancy at birth (see Figure 6). Most of these districts are in green belt areas. The longest life expectancy – 79.4 years – was in the 2nd district, where the per capita gross income – HUF 1.4 million – and the proportion of people of 25 and over with tertiary educational attainment – 47.3 percent – were also highest. These figures were by far the best in both Budapest and the country as a whole. Life expectancy was 5.4 years longer than the Budapest average, and 7.2 years longer than those of the 8th and 10th districts, where life expectancies were worst. It is worth noting that a child born in the 2nd district in the first few years of the 21st century could look forward to a life eleven years longer than one born in the LAU-1 of Bodrogköz.

Only one of the Pest districts – the small, central 5th district – has a place in the first quintile, and two – the 14th and 17th, consisting largely of detached houses and small blocks of flats – are in the second quintile. Four Pest districts are in the third quintile, five in the fourth, and another five in the fifth. Of those in the fifth quintile, the 8th and 9th districts are former solid lower-middle-class areas brought into decline

by the turbulent, traumatic history of the city. In the 8th district informal segregation has evolved following an influx of Roma people. Many of the people living in the 4th, 10th and 20th districts are industrial workers. Life expectancy is worst in the 8th, 9th, 10th and 20th districts, which form a contiguous island in the south-east of the city, but is about the same in the northern peripheral 4th district. Across the city as a whole, life expectancy decreases along a north-west/south-east diagonal axis: as discussed above, it is highest in the 1st, 2nd and 12th districts in Buda and the 5th in Pest, and lowest in the 8th and 10th districts, also in Pest.

The following table gives the breakdown of districts by quintiles, and Figure 6 shows life expectancy at birth.

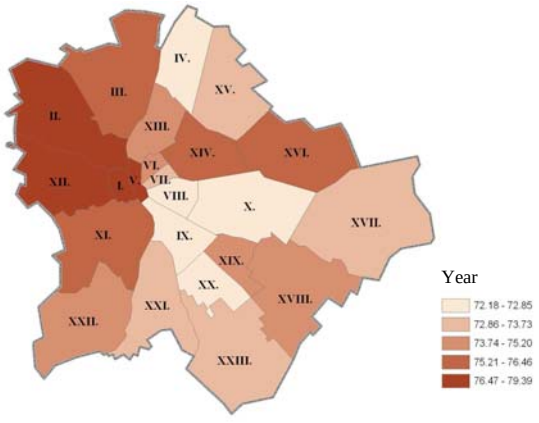
Life expectancy at birth, per capita gross income and percent of people with tertiary educational attainment in the 25 years and over population in Budapest districts, 2003–2006

Budapest district quintiles*	Number of inhabitants**	Highest and lowest values of		
		life expectancy at birth (years)	per capita gross in come (thousand HUF)	percent of 25 years and over population with tertiary educational attainment
1st quintile: 1st, 2nd, 5th, 12th	197 408	76.7–79.4	1096.2–1398.3	32.1–47.3
2nd quintile: 3rd, 11th, 14th, 16th	449 411	75.4–76.5	895.4–985.5	21.1–33.7
3rd quintile: 6th, 13th, 18th, 19th, 22nd	356 502	74.2–75.2	794.7–926.2	15.0–25.4
4th quintile: 7th, 15th, 17th, 21st, 23rd	318 891	73.3–73.7	671.8–846.4	12.0–20.8
5th quintile: 4th, 8th, 9th, 10th, 20th	379 911	72.2–72.9	615.9–914.8	12.9–21.3
Budapest	1 702 123	74.1	887.4	23.8

* Classified by decreasing life expectancy at birth.

** Average population in the period of 2003–2006.

Figure 6. Life expectancy at birth in Budapest districts, 2003–2006



The correlation coefficient between the gross income per capita and life expectancy at birth is 0.91522, whilst it is 0.86057 between the proportion of people with tertiary educational attainment (in the population 25 years old and older) and life expectancy at birth; both are highly significant: $p<0.0001$.

It may be concluded that among the independent variables the educational attainment is the decisive one, in our case it means the proportion of people with tertiary education in the population 25 years old and older in the observational units. In general, if the educational attainment is a tertiary one then the gross income per capita is high, and conversely with primary educational attainment only the gross income per capita is low. By and large people with low educational attainment: mainly unskilled, semiskilled workers and agricultural labourers are the losers of the socio-economic and political transition. This statement can be proved by simple regression analysis. The correlation coefficient between the proportion of people with tertiary educational attainment and the per capita gross income is 0.79940 in the case of 168 LAUs-1 and 0.90163 in the case of the 23 districts of the capital, both are highly significant: $p<0.0001$.

Urban Resource Efficiency: The Case of Budapest*

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At the period of urbanization the sustainable uses of natural resources have become more and more important in the most developed countries. Exploring urban material flows could help to better understand complex input-output processes and the material consumption of the population.

The economic changes in Budapest between 1950 and 1990, coupled with a large population increase, brought about greater resource needs and unprecedented waste generation habits. After the political transformation in 1990, radical economic, demographic and social changes occurred, which had altogether a great impact on different resource uses (for example water, energy, land, and food) and resource efficiency.

This paper highlights the economic and environmental transformation of Budapest by emphasizing the following aspects: development and transformation of the economy; material resource consumption and waste generation, as well as related environmental impacts. The main findings and recommendations of the case study can contribute to underpin a more resource-efficient urban policy and design.

KEYWORDS:
Urbanisation.
Environmental statistics.
Sustainable development.

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In 2005, 3.2 billion people lived in cities, four times more than in 1950. With this, the urban population almost reached the half of the Earth's total population. The urban population exceeded the magic number of one billion in 1961. Only one quarter of century needed to grow with another one billion urban inhabitants, and later, only 17 years for a further increase of one billion. This clearly shows the quick pace and irresistibility of the urbanisation process. In 2003 nearly half of the world population lived in cities and this number will reach four billion by 2018 and five billion by 2030. The urbanisation process is well advanced in the developed regions reaching 74 percent of the population in cities. According to different outlooks this rate will increase to 80 percent by 2030 (*OECD* [2008a]). In developing countries the pace of urbanisation is much slower, although it can increase from 43 percent of 2003 to 56 percent by 2030.

In 1950, there were only two megacities, the population of which exceeded 10 million. Half a century later the number of megacities amounted to 20, and it will be 22 in 2015, from which 17 are in developing countries. Today the biggest urban population exists in Tokyo of 35 million inhabitants followed by Mexico City and New York (19–19 million), and Sao Paolo (18 million). In 2005 more than 9 percent of the world population lived in megacities, but this rate will further increase by 2015. The quick urban population explosion of megacities can be illustrated by the fact that since 1950 the population of Delhi has grown eleven-fold, that of Sao Paolo eight-fold and Mexico City seven-fold.

This study is a first attempt to analyse the urban metabolism of Budapest which is a Central-European city and the capital of Hungary. The social, economic and environmental transformation in the last half century can be presented through the use of resources (water, energy, etc.) and the related environmental impacts. This study can not be considered as a comprehensive and quantitative overview of the metabolic processes of Budapest, because it would require further gathering of statistical data and information. At the same time the present phase of the research makes possible to publish preliminary results and to explore certain trends. From the methodological point of view it proved to be easier to examine the input side of urban metabolism, but as we have seen in the cases of other cities, one could face difficulties as regards the output side. Similar problems were found concerning the identification of built-in material stock of the cities (buildings, roads, etc.). On the input side water and energy use, food consumption, while on the output side wastewater, air pollution and municipal solid waste were taken into consideration. At this time the analysis of material stock was limited to building stock and passenger car fleet.

1. The work of the Organisation for Economic Co-operation and Development (OECD) on resource efficiency

Natural resources are fundamental for the economy and prosperity. They provide raw materials, energy, food, water, and land, as well as environmental and social services. The use of materials from natural resources in human activities and the attendant production and consumption processes have many economic, social and environmental consequences that often extend beyond the borders of single countries or regions (*OECD* [2008b]):

> – From an economic perspective, the manner in which natural resources are used and managed affects *a*) the short-term costs and the long-term economic sustainability; *b*) the supply of strategically important materials; and *c*) the productivity of economic activities and industrial sectors.
>
> – From a social point of view, the exploitation and use of natural resources and materials affects employment, human health, and the population's recreational access to particular resources, landscapes and ecosystems. Natural resources also are a basic element of the cultural heritage of many people, notably of indigenous cultures. Furthermore, social equity considerations play an important role in the way revenues and other financial flows associated with resource production and supply are managed, particularly in resource-rich countries.
>
> – From an environmental perspective, the use of natural resources and materials needs to be considered in terms of *a*) the rate of extraction and depletion of renewable and non-renewable resource stocks; *b*) the extent of the harvest and the reproductive capacity and natural productivity of renewable resources; and *c*) the associated environmental burden (for example pollution, waste, habitat disruption), and its effects on environmental quality (for instance air, water, soil, biodiversity, landscape) and on related environmental services.

Making sure that the natural resources and materials are managed well and used efficiently through their life cycle is a key to economic growth, environmental quality and sustainable development. It helps reduce the negative environmental impacts associated with the production, consumption and end-of-life management of natural resources, a concern that has long been on the policy agenda of OECD countries. It also helps indirectly reduce the demand pressures on natural resources in the context of the global economy. This is particularly important in a world, where the prices of many natural resources are rising fast; and where there are often concerns about the

long-term security of the supply of natural resources. Supply security is a strategic concern for governments and businesses alike; efficient management of the environmental impacts associated with using these resources will increase their long-term availability (and quality) for everyone.

Over the past two decades, the worldwide use of virtually every significant material has been rising. Growing economic and trade integration among countries has enlarged the size of markets, allowed greater specialisation and mobility in production, increased the role of multinational enterprises, and led to an overall increase in international flows in raw materials and manufactured goods. In consequence, the scale of many policy issues has widened from the local and national to the global. In recent years, prices for energy and other material resources have risen significantly amid growing demands from OECD and other countries, notably from fast-growing economies. Rising prices affect the manner in which natural resources are supplied to and used in the economy. They also influence decisions about technological development and innovation. Hence, natural resource consumption and the economic efficiency of materials use have become important issues, adding to longstanding concerns about natural resource management and the environmental effectiveness of materials use (*OECD* [2008b]).

In the next 50 years, the world population will continue to grow, as will the world economy, placing increasing strains on a variety of material and energy resources and the global environment. This creates unprecedented economic and environmental challenges for policy- and decision-makers. The question arises as to how to sustain economic growth and welfare in the longer term whilst keeping negative environmental impacts in check and preserving natural resources.

1.1. The political importance of resource efficiency

Responding to these issues, the Heads of State and Government of the G8 countries paid specific attention to the resource basis of economies at their summits in 2003, 2004, 2006, 2007, and 2008.

In 2004, the OECD Council adopted a "*Recommendation on material flows and resource productivity*" asking OECD countries to improve information and knowledge on material flows and resource productivity and to develop common methodologies and measurement systems, with emphasis on areas in which comparable and practicable indicators can be defined (*OECD* [2004]). In early 2008, the OECD Council adopted the second "*Recommendation on Resource Productivity*" that urges member states with regard to the analysis of the material flows and their environmental impacts and to policies relating to the improvement of resource productivity (*OECD* [2008c], [2008d]):

– to improve the scientific knowledge concerning the environmental impacts and costs of resource use,

– to upgrade the extent and quality of data on material flows,

– to further develop and to promote the use of indicators for the assessment of the efficiency of material resource use including indicators to measure resource productivity and decoupling of resource use from economic growth,

– to use information on material flows and their environmental impacts for planning purposes and target settings.

In 2007, an International Panel on Sustainable Resource Management was set up by the United Nations Environment Programme (UNEP) with the support of the European Commission to address resource efficiency issues from a life-cycle perspective, and to provide scientific assessment on the associated environmental impacts. Sustainable resource use is further supported by international efforts to promote good governance in the raw materials sector and to make the management of natural resource rents more transparent.

In the late 1990s, Eurostat in co-operation with other relevant international organisations such as OECD and UN Statistical Division elaborated and published a comprehensive methodological framework for analysing economy-wide material flow accounts (*Eurostat* [2001]). This methodology provides a practical tool for establishing material flow accounts and balances and for deriving a set of physical indicators for a whole economy. The guide also offers help to compilers on the types of accounts to be implemented first, on data sources and methods and on the interpretation of the derived indicators. Material flow analysis (MFA) can be applied to a wide range of economic, administrative or natural entities, studying the flows of materials within the global economy or within the economy of a region or a country (macro level), within an economic and a sectoral activity (meso level), within a city, a river basin or an ecosystem, a firm or a plant (micro level). Micro level MFA provides detailed information for specific decision processes at business (company, firm, plant) or local level (city, municipality, ecosystem, habitat, river basin) or concerning specific substances or individual products.

2. Urban metabolism

The phenomenon of social metabolism and its territorial presence in the cities of OECD and non-OECD countries was analysed by *Pomázi* and *Szabó* [2006] in detail.

The examination of urban metabolism requires inter- and multidisciplinary approach since cities as ecosystems represent a very complex and comprehensive system of social, economic and environmental processes.

The concept of urban metabolism can help in better understanding of the sustainable development of cities by drawing analogies with the metabolic processes of living organisms. One can discover a lot of similarities between functioning and metabolism of biological organisms and those of cities. Cities transform the incoming raw materials, fuels, food and water into the built environment, human biomass, and residuals (*Decker et al.* [2000]). The analysis of urban metabolism practically means the quantitative exploration of inputs and outputs of energy, water, nutrients, raw materials, and wastes.

Urban metabolism can be defined as a complexity of technical, social and economic processes of cities, manifested in growth, energy production and neutralisation of refuse. Until now only a few studies were devoted to the calculation of energy flows in cities, the researchers rather focused on nutrients, raw materials and the hydrological cycle. Urban metabolism is worth studying from different perspectives. Firstly, the exploitation of resources and the generated waste can be well measured by the features of metabolism; these can be also used as sustainability indicators. Secondly, the analysis of urban metabolism makes possible to measure resource efficiency and to explore the cyclical flows of resources. In addition, this provides a good analytical framework for the accounting of urban stocks and throughputs, for the better understanding of critical processes as well (increasing or decreasing ground water resources, heat islands, long term impacts of hazardous construction materials).

Several factors influence urban metabolism. The urban structure including population density and morphology, and transport technology can influence energy and material flow. In the case of cities with large area and low population density per capita, the energy intensity of transport is much higher in comparison with a compact city. Climate also has a great impact on urban metabolism since heating energy demand is much bigger in a winter under continental climate than in a Mediterranean city. The applied technology, the share of vegetation, the energy prices, the age, and quality of building stock also influence the energy use of cities.

The city studies generally show that metabolism is increasing. This is natural in absolute terms, when the population of cities is also growing. At the same time the per capita values are increasing, too.

An American engineer, *Abel Wolman* regarded as the father of urban metabolism, described the phenomenon of urban metabolism on the example of a hypothetic one-million city (*Wolman* [1965]).

According to *Wolman* [1965]: "*The metabolism of a city can be defined as all the materials and commodities needed to sustain the city's inhabitants at home, at work*

and at play". One of Wolman's later followers, *Thomas Graedel* [1999] defined the cities as living organisms: "*Cities can be regarded as organisms, and analyzed as such, in an attempt to improve their current environmental performance and long-term sustainability.*"

Graedel [1999] has elaborated a triangle consisting of ten components to assess urban metabolism, which he called "ecocity metrics" and used it for Vancouver. (See Figure 1.) He set up a system of principles for creating a sustainable city (ecocity) as follows:

– The city must be sustainable over the long term.

– The city must follow a system approach to assess environmental interactions.

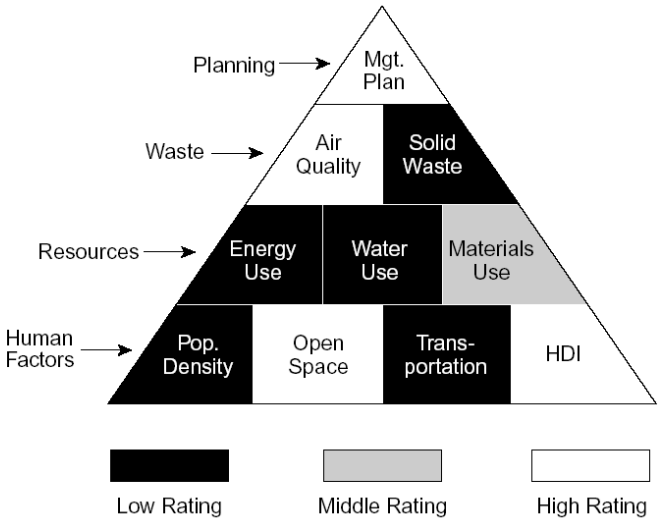
– City planning must be flexible enough to be able to follow city growth and changes.

– The open spaces of an ecocity must serve multiple functions.

– The city must become part of regional and global economies.

– The city must be attractive and workable.

Figure 1. The Graedel triangle



Source: *Graedel* [1999].

In the last decades a relatively small number of studies were produced on the changes of urban metabolism. The majority of them focused on cities with big territory and population. One of the initial and comprehensive analyses was prepared on

Brussels by Belgian ecologists *Duvigneaud* and *Denaeyer-De Smet* [1977], which is a classical work of the history of analysing urban metabolism.

The first urban metabolism studies were carried out in the 1970s and 1980s within the framework of UNESCO Man and Biosphere Programme. In 1978, *Newcombe* and his colleagues published a paper on construction materials and the input-output of manufactured products in Hong Kong (*Newcombe et al.* [1978]). Revisiting this study, *Warren-Rhodes* and *Koenig* [2001] pointed out that per capita food-, water-, and material consumption in Hong Kong between 1971 and 1997 increased by 20, 40 and 149 percent, respectively. The increasing trends of per capita resource input and waste production in Sydney were examined by *Newman* [1999]. *Sahely* and his research fellows studied the urban metabolism in Toronto, where for example the amount of household waste decreased between 1987 and 1999 (*Sahely et al.* [2003]). Similar research was performed for Tokyo (*Hanya–Ambe* [1976]), Prague (*Stanners-Bourdeau* [1995]), Vienna (*Daxbeck et al.* [1996], *Obernosterer et al.* [1998], *Hendriks et al.* [2000]), Taipei (*Huang* [1998]), Amsterdam (*Gorree–Kleijn–Van Voet* [2000]), Ann Arbor (*Melaina–Keoleian* [2001]), Greater London (*Chartered Institute of Wastes Management* [2002]), Cape Town (*Gasson* [2002]), Hamburg (*Hammer–Giljum–Hinterberger* [2003]), Tipperary Town, Ireland (*Browne et al.* [2005]), Nantong (*Yu–Huang* [2005]) and Schenzhen (*Yan–Liu–Huang* [2003], *Yan–Zhifeng* [2007]). There are also comprehensive studies containing integrated environmental assessment of 26 and 24 European cities in 2006 and 2007, respectively (*Bono–Castri–Tarzia* [2006], *Berrini–Bono* [2007]). The investigation of urban metabolism can be connected to the application of the ecological footprint methodology of cities. Analytical studies of urban ecological footprint were prepared for Vancouver (*Wackernagel–Rees* [1995]), Santiago de Chile (*Wackernagel* [1998]), Cardiff (*Collins et al.* [2006]), and the cities of the Baltic region (*Folke et al.* [1997]).

The urban audit is also a useful complementary tool for measuring the quality of life in the cities. Following a pilot project for the collection of comparable statistics and indicators for European cities, the first full-scale European Urban Audit took place in 2003, for the then 15 countries of the European Union. In 2004, the project was extended to the 10 new member states plus Bulgaria, Romania and Turkey. Under Eurostat coordination, the work of the Urban Audit involves all national statistical offices. The second full-scale Urban Audit was carried out between 2006 and 2007, and involved 321 European cities (including Budapest) in the 27 member states of the European Union, along with 36 additional cities in Norway, Switzerland and Turkey. Data collection currently takes place every three years, but an annual data collection is being planned for a smaller number of targeted variables (www.urbanaudit.org).

The Urban Audit collected data for over 250 indicators across the following domains: demography, social aspects, economic aspects, civic involvement, training and education, environment, travel and transport, information society, culture and recreation.

3. Budapest

Hungary's capital, Budapest together with its surroundings is a highly developed metropolitan region in Central Europe, where the technical and economic advances have made it possible to support about 2.5 million people (25 percent of the country's total population) on a land area of about 2500 km^2. This population depends on a continual supply of materials, energy and information in everyday function. Economic activities are highly concentrated in Budapest conurbation producing roughly 40 percent of the national Gross Domestic Product.

3.1. Brief history

The land which was settled by the founding Hungarians had been inhabited territory since pre-historical times.

The ensued political and economic stabilization brought about the unification of three historical cities – Buda, Óbuda, and Pest – in 1873. The new city had the name Budapest.

The new era of construction – public and apartment buildings, bridges, and modern local transportation – started, the streets began to be paved - first with rocks and cobblestones then with asphalt. After 1850 construction began on the new water sewer and later gas and electricity systems.

Later, from a governmental standpoint another decisive change took place: on 1st January 1950 the surrounding cities and other settlements were connected to Budapest, and Greater Budapest came into existence with 22 districts (currently 23) in place of the old 10 later 14. By attaching 7 towns and 16 villages to the former Budapest, its area enlarged from 207 km² to 525 km² (154%), the number of its inhabitants increased from 1.05 million to 1.6 million (52%), and the number of its districts augmented from 14 to 22 (57%), thus it became the seventh metropolis of Europe in its time.

In 2007, the main social, economic and environmental indicators of Budapest were as follows:

– Social context:
  Total population: 1.7 million;
  Population density: 3238 capita per km^2.
– Economic context:
  GDP: 40 percent of the country's total GDP;
  Passenger cars: 35 per 100 capita.

– Environmental context:
Green areas: 9.9 m^2 per capita;
Annual municipal waste generation: 630 kg per capita;
Annual CO_2 emissions: 5.7 t per capita.

3.2. Main economic, social and environmental trends

Population of Greater Budapest increased from 1.6 million of the early 1950s to 2.06 million in 1980. From 1980 onwards, the population has been dwindling due to the decreasing birth rate on one hand, and migration to surrounding settlements (suburbanisation) on the other. In 2006, the population dropped to 82.5 percent of its level of 1980. While 19.2 percent of the country's total population lived in the capital in 1980, only 16.8 percent of the population of Hungary counted as residents of Budapest in 2006.

During this time period, the stock of dwellings also changed significantly. According to official statistics, there were 536 thousand dwellings in 1960, their stock has been increasing continuously, although the pace of building panel blocks of flats begun in the 1960s (1.6 percent average increase per year) slowed to an annual 0.5 percent after 1990. Concerning long time series between 1960 and 1990, materials were built into the stock of dwellings of Budapest at such a pace that has never experienced before. This increase is characterised by the fact that the city's population per dwelling was 3.3 capita in 1960, while it was less than 2 capita in 2006. It is also specific that one in five dwellings built in the country during the 1980s was located in Budapest. Panel blocks of flats have been planned for 30–70 year span of life, so the very first ones are approaching the end of their life span, and they are requiring complete renovation or waiting for demolition. In aware of this situation, it is expectable that demolition waste stream will be increasing significantly in the coming decades.

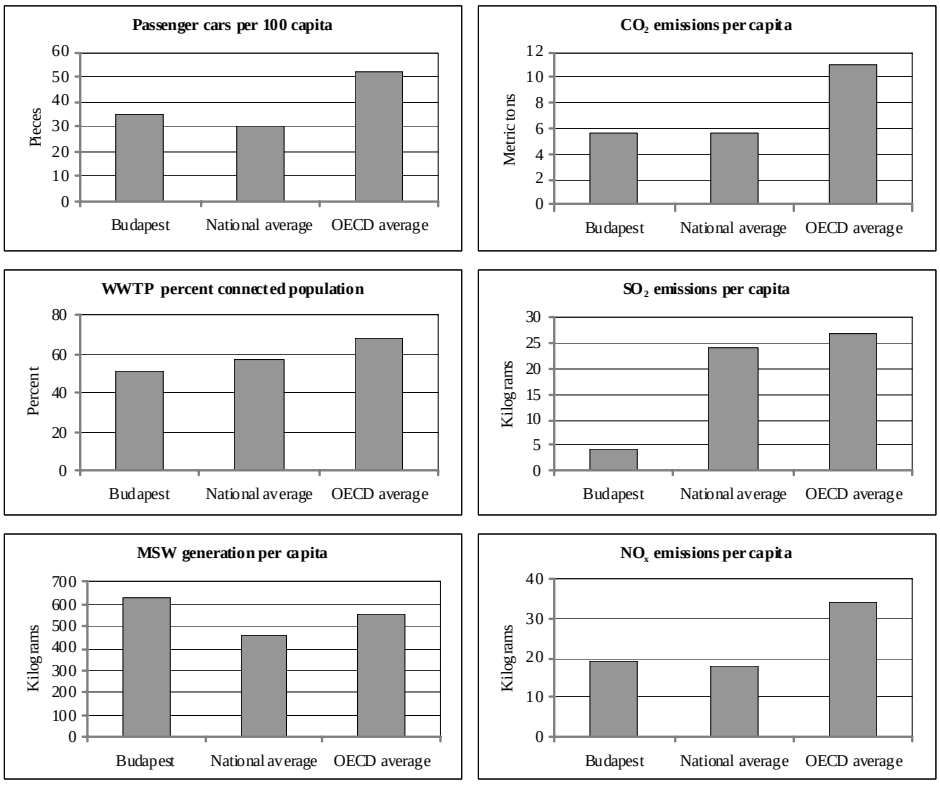
The stock of passenger cars expanded from 39 thousand of 1965 to 596 thousands in 2005 showing a fifteen-fold increase. However, per 100 capita stock of passenger cars still hardly exceeds half of the OECD average (35 versus 52). During these four decades, there was a roughly three-and-a-half-fold enlargement in the stock of buses, while that of lorries increased by almost three-fold.

During the half century covered by the research, inventories of durable goods including refrigerators, washing machines, televisions, etc. enlarged outstandingly and major transformations occurred in their structure. Since elements of the stock sooner or later will emerge on the output side of material flows as waste streams and can cause serious environmental consequences, their investigation is indispensable for mapping the overall picture of material flows. However, a detailed analysis of household statistics is required in order to understand the process in depth. According to the data of 2005, the per capita municipal solid waste generation was about 630 kg compared with the national average of 460 kg and the OECD average of 560 kg.

Data of 2005 show that hardly half of the population of Budapest is connected to waste water treatment plants. At the same time, this share barely approached 35 percent at the national level, while the OECD average was about 70 percent. However, a significant increase is probable in the share of the population connected to waste water treatment plants (WWTP) if a new waste water treatment plant being under construction with high purification capacity is installed.

As far as the emissions of air pollutants are concerned, both Budapest and country data are below – sometimes well below – the OECD average in the case of sulphur dioxide, nitrogen oxides and carbon dioxide. The gap is very significant for sulphur dioxide: while national average is next to the OECD average, per capita emissions of Budapest are one fifth and one sixth of their values, respectively. In the case of nitrogen oxides and carbon dioxide due to transport volume and concentration, the emissions of the capital exceed the national levels, however, they are only about half of the OECD average. (See Figure 2.)

Figure 2. Comparison of selected environment-related indicators, 2005



Note: WWTP: waste water treatment plant; MSW: municipal solid waste.
Source: The authors'own calculation based on Hungarian and OECD statistics.

3.3. Evolution of urban metabolism in historical perspective for the period of 1955–2005

In the longitudinal investigation of the urban metabolism of Budapest the following components were used on the input side:

– total water consumption,
– total (natural) gas consumption,
– total electricity consumption,
– total quantity of heat,
– food consumption.

On the output side of urban metabolism the following components were available in longer time series:

– total waste water,
– total municipal solid waste collected,
– emissions of air pollutants (CO_2, SO_2, NO_x, CO and particulate matter).

Since the units of the previously mentioned elements are differing from one another (m^3, MWh, t), their transformation is inevitable to aggregate the constituents of material flows both on input and output sides into one major flow of materials and energy. The common unit is metric ton, a widely used mass unit in material flow analysis.

In the case of water consumption, 1 m^3 water accounts for 1 ton water, while in gas consumption 1000 m^3 gas equals to 0.74 ton gas. As for electricity, the situation is more complex because until the mid-1980s electricity generation was mainly based on hard coal, but later, energy production was switched over – in a relatively short time period – to the use of natural gas. According to this fact, the following transformation figures were used: between 1955 and 1985: 1 MWh ~ 0.086·0.7 ~ 0.0602 ton oil equivalent (toe), after 1985: 1 MWh ~ 0.086 toe. Similarly, in the case of heat consumption: between 1970 and 1985: 1TJ ~ 23.887·0.7 ~ 16.721 toe, after 1985: 1TJ ~ 23.887 toe.

Researching the total resources consumption of Budapest (without construction materials) between 1965 and 2005, the following main scientific findings can be highlighted:

– In 1965, the per capita total resources consumption together with water consumption was 114.5 tons, while it was 0.88 ton without water

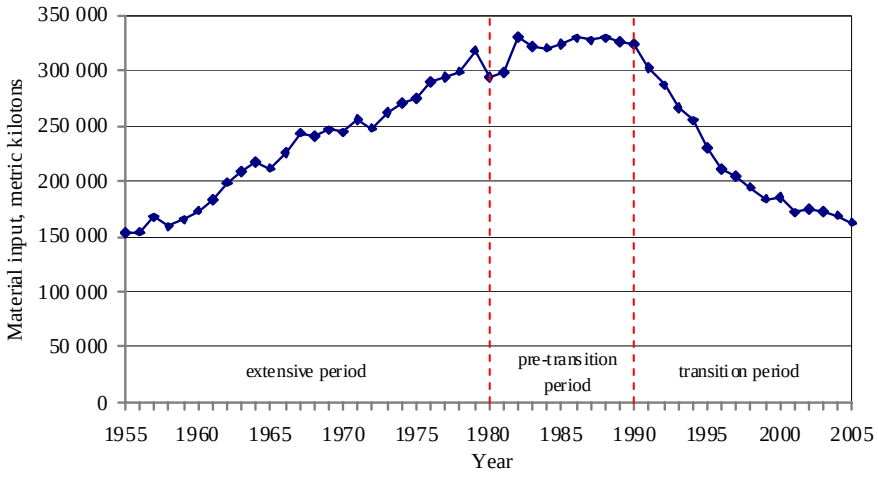
consumption showing that the used water quantity was about one hundred and thirty fold compared with other resources. In 2005, this indicator pair was 88 and 1.8 tons per capita, respectively, which means about fifty-fold more consumption of water than that of other resources.

– In 1965, total water consumption was 210 million tons, while it reached 327 million tons in 1986 (this latter was the maximum value of the studied time period, and was also an absolute record in the history of Budapest); in 2005, water consumption was 160 million tons accounted for 75 percent of the level of 1965, however, it dropped by more than 50 percent compared with the record.

On the basis of the study on total resource use of Budapest covering half a century, three main periods could be distinguished.

Concerning the input side of resource efficiency, the first period lasted from 1955 to 1980, which can be considered as the extensive socialist development phase of the metropolis. In this era, energy and water use, as well as food consumption increased at a significant pace. The next shorter period between 1980 and 1990 can be regarded as a pre-transition period characterised by temporary stagnation of resource use. The third period begun in 1990 is featured by a robust improvement in resource efficiency.

Figure 3. Evolution of urban metabolism in historical perspective – input side, 1955–2005

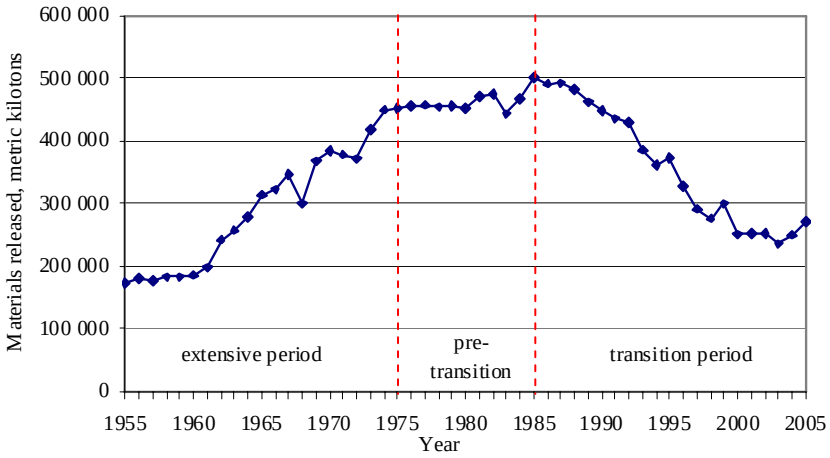


Source: The authors' own calculation.

This development of resource productivity can be explained by the notable decrease of the population, the transformation of the consumption patterns of the city, and a more consequent application of the "user pays" principle. The latter one convincingly shows, for example, that water fees increased by two and a half fold during the last decade, and as a consequence, the consumption habits of households altered rapidly (water consumption decreased by about one fourth). (See Figure 3.)

Considering the output side of resource efficiency, a five-year shift can be recognised, compared with the input side. The output side can be divided into the following periods: the first one (extensive period) lasted from 1955 to 1975; the second one, the era of stagnation or pre-transition period was between 1975 and 1985, while the third period (transition period) is still going on, although not so "spectacularly" as in the case of the input side. (See Figure 4.)

Figure 4. Evolution of urban metabolism in historical perspective – output side, 1955–2005



Source: The authors' own calculation.

The annual quantity of collected municipal solid waste increased by about five-fold (from 120 to 630 kg per capita) between 1955 and 2005. This trend unambiguously shows the specific features of the "throwing away" consumption society of Budapest. The change in the composition of waste between 1990 and 2005 illustrates the previously mentioned alteration of consumption patterns. At the beginning of the 1990s the share of plastics in waste was about 5 percent, however, it has been significantly increasing from 1997 onward, and its share approached 17 percent in 2005. (See Table.) One of the major measuring tools of urban metabolism is the monitoring of waste flows, and the diversion of waste streams from final disposal and incineration, namely the prevention and reduction of waste generation, as well as the reuse

and recycle of waste. "3R" policies (reduce, reuse, and recycle) initiated by Japan and confirmed at several G8 summits can be used at the city level as well, and should be regarded as an important part of sustainable city planning (*Namiki* [2008]).

Composition of municipal solid waste in Budapest, 1990–2005
(percent)

Year	Paper	Plastics	Plastics with paper	Textile	Degradable organic matter	Glass	Metal	Hazardous waste	Other inorganic and fine fraction (<16 mm)	Hospital waste
1990	19.6	4.6		6.8	32.3	5.3	6.0	..	25.4	..
1991	17.9	4.6		3.1	38.3	3.4	4.3	..	28.4	
1992	18.5	4.4		4.3	38.9	4.8	4.4	..	24.7	
1993	17.1	5.6		6.5	34.6	5.0	4.8	..	26.4	
1994	18.2	5.7		5.3	33.4	4.7	4.0	..	28.7	
1995	17.0	3.5		4.3	35.1	3.1	4.2	..	32.8	..
1996	19.0	4.5		3.4	32.4	3.0	3.8	1.1	32.8	
1997	19.2	3.5	8.0	5.8	28.4	2.8	2.2	0.8	29.3	
1998	18.3	9.3		6.4	31.4	4.7	3.9	1.0	22.0	3.0
1999	20.2	12.3		5.1	30.7	4.3	3.1	0.6	20.7	3.0
2000	13.7	9.8		3.5	40.7	2.5	1.8	0.2	26.5	1.3
2001	16.0	13.0		2.5	40.4	2.2	1.6	0.3	22.0	2.0
2002	16.3	15.9		3.0	30.7	2.4	1.8	0.4	27.2	2.3
2003	15.6	14.9		3.0	29.7	2.5	1.9	0.5	29.4	2.5
2004	15.2	15.4		2.9	30.6	2.3	1.9	0.6	28.9	2.2
2005	14.6	16.7		3.0	29.4	2.2	1.8	0.5	29.4	2.4

Source: *HCSO* [2006].

3.4. Resource-related targets selected from the Budapest Environmental Programme of 2008–2013

In 2007, the Budapest City Council adopted the Budapest Environmental Programme for the period of 2008–2013 that includes several measures aiming at a more efficient use of natural resources. In the field of energy management, it was targeted that total energy consumption of Budapest should be reduced by ten percent by 2013. To this end, insulation of buildings, as well as individual heat metering of blocks of flats and regulation of heating systems shall be continued. A ten-percent reduction should also be reached in energy consumption of the city-owned public institutions.

The share of using renewable energy sources shall achieve five percent in total energy consumption.

Green areas play a very important role in the "life" of a metropolis since they can for example reduce significantly the risk of emerging of a city heat island. According to the Budapest Environmental Programme, the green area coverage shall be maintained at its 2005 level, and the per capita figure shall exceed the 2005 level (6.2 m^2).

The indicative target to reduce the per capita solid municipal waste generation is 540 and 500 kg by 2013 and 2020, respectively (it was 580 kg in 2006). The share of selective waste collection should be improved by another 5 percent, while that of biologically degradable organic waste should be increased from 4 percent to 25 percent and that of packaging waste from 50 percent to 60 percent by 2013.

The Budapest Environmental Programme, unfortunately, does not set up indicative targets for waste water treatment, although it is one of the "hottest" environmental problems in the capital of Hungary. In Budapest, untreated waste water represents quite a high proportion (only 51 percent of the waste water is treated biologically), and almost half of the waste water is canalised directly into the Danube as a major sink.

4. Conclusions and recommendations

Based upon the analysis of urban efficiency in Budapest, the following conclusions and recommendations are drawn:

– The *OECD* recommendations [2004], [2008d] related to resource productivity and material flows are very useful instruments to measure resource productivity at the micro level including cities.

– Data gaps in time series and methodological changes strongly limit overall calculations of aggregated material flow indicators and without careful consideration this can easily lead to misinterpretation.

– Data availability both in quality and quantity on output side should be improved in comparison with input side data.

– Disaggregated information could provide much more relevant messages for policy-makers than highly aggregated indices at the micro level.

– Better exploration of dissipative resource flows (for example loss of water, heat and hazardous substances) and the net addition to stock and food-related flows can underpin resource efficiency measures.

– The policy relevance of material flows related information should always be taken into consideration.

– The analysis of urban metabolism/efficiency can contribute to sustainable city planning and help to prepare cost effective policies and measures.

References

BERRINI, M. – BONO, L. [2007]: *The Urban Ecosystem Europe Report 2007*. Ambiente Italia Research Institute. Milano.

BONO, L. – CASTRI, R. – TARZIA, V. [2006]: *The Urban Ecosystem Europe Report 2006*. Ambiente Italia Research Institute. Milano.

BROWNE, D. – O'REGAN, B. – MOLES, R. [2005]: A Comparative Analysis of the Application of Sustainability Metric Tools Using Tipperary Town, Ireland, as a Case Study. *Management of Environmental Quality.* Vol. 16. No 1. pp. 37–56.

CHARTERED INSTITUTE OF WASTES MANAGEMENT [2002]: *City Limits: A Resource Flow and Ecological Footprint Analysis of Greater London*. Best Foot Forward Ltd. London.

COLLINS, A. ET AL. [2006]: The Environmental Impacts of Consumption at a Subnational Level: The Ecological Footprint of Cardiff. *Journal of Industrial Ecology.* Vol. 10. No. 3. pp. 9–24.

DAXBECK, H. ET AL. (1996): *Der anthropogene Stoffhaushalt der Stadt Wien – N, C und Pb* (Projekt Pilot). Institut für Wassergüte und Abfallwirtschaft, Technische Universität. Wien.

DECKER, H. ET AL. [2000]: Energy and Material Flow Through the Urban Ecosystem. *Annual Review of Energy and the Environment.* Vol. 25. pp. 685–740.

DUVIGNEAUD, P. – DENAEYER-DE SMET. S. [1977]: *L'ecosystéme urbain bruxellois*. [The Brussels urban ecosystem.] In: *Duvigneaud, P., Kestemont, P.* (eds.) *Productivité en Belgique*. Traveaux de la Section Belge du Programme Biologique International. Brussels.

EUROSTAT (2001): *Economy-Wide Material Flow Accounts and Derived Indicators – A Methodological Guide*. European Commission. Luxembourg.

FOLKE, C. ET AL. [1997]: Ecosystem Appropriation by Cities. *Ambio.* Vol. 26. No. 3. pp. 167–172.

GASSON, B. [2002]: *The Ecological Footprint of Cape Town: Unsustainable Resource Use and Planning Implications.* Paper presented at SAPI International Conference: Planning Africa. 17–20 September. Durban.

GORREE, M. – KLEIJN, R. – VAN VOET, E. [2000]: *Materiaalstromen door Amsterdam*. Centrum Milieukunde Leiden. Milieudiens Amsterdam.

GRAEDEL, T. E. [1999]: Industrial Ecology and the Ecocity. *The Bridge.* Vol. 29. No. 4. pp. 10–14.

HAMMER, M. – GILJUM, S. – HINTERBERGER, F. [2003]: *Material Flow Analysis of the City of Hamburg*. Paper presented at the Workshop Quo vadis MFA? Material Flow Analysis–Where Do We Go? Issues, Trends and Perspectives of Research for Sustainable Resource Use. 9–10 October. Wuppertal.

HANYA, T. – AMBE, Y. [1976]: A Study on the Metabolism of Cities. In: *Science for a Better Environment*. Science Council of Japan. Tokyo. pp. 228–233.

HCSO [1955–2006]: *Budapest Statistical Yearbooks, 1955–2006*. Budapest.

HCSO [1955–2006]: *Public Utilities, 1955–2006*. Budapest.

HCSO [1955–2007]: *Yearbooks of Hungary, 1955–2007.* Budapest.

HCSO [1996–2005]: *Environmental Statistical Yearbook of Hungary, 1996–2005*. Budapest.

HENDRIKS, C. ET AL. [2000]: Material Flow Analysis: A Tool to Support Environmental Policy Decision-making. Two case studies on the city of Vienna and the Swiss lowlands. *Local Environment.* Vol. 5. pp. 311–328.

HUANG, S. [1998]: Urban Ecosystems, Energetic Hierarchies, and Ecological Economics of Taipei Metropolis. *Journal of Environmental Management.* Vol. 52. No. 1. pp. 39–51.

MELAINA, M. – KEOLEIAN, G. [2001]: *A Framework for Urban Energy Metabolism Studies: An Ann Arbor, Michigan Case Study.* Paper presented at the Science & Culture of Industrial Ecology Conference of the International Society for Industrial Ecology. 12–14 November. Leiden.

NAMIKI, M. [2008]: *Promotion of Sound Material-Cycle Society in Japan and 3R Initiative.* Paper presented at the OECD-UNEP Conference on Resource Efficiency. 23–25 April 2008. Paris.

NEWCOMBE, K. – KALINA, J. D. – ASTON, A. R. [1978]: The Metabolism of a City: The Case of Hong Kong. *Ambio.* Vol. 7. No. 1. pp. 3–15.

NEWMAN, P. W. G. ET AL. [1996]: Human Settlements. In: *Newman, P. W. G.* (ed.): *Australian State of the Environment Report 1996*. Department of Environment, Sport and Territories, State of the Environment Advisory Council. Canberra. pp. 1–57.

OBERNOSTERER, R. ET AL. [1998]: *Materials Accounting as a Tool for Decision-making in Environmental Policy. Urban Metabolism of Vienna.* Technical University of Vienna. Vienna.

OECD [2004]: *Council Recommendation on Material Flows and Resource Productivity.* C(2004)79. Paris.

OECD [2008a]: *OECD Environmental Outlook to 2030*. OECD. Paris.

OECD [2008b]: *Measuring Material Flows and Resource Productivity, Synthesis Report.* OECD. Paris.

OECD [2008c]: *Chair's Summary*. Meeting of the Environment Policy Committee at Ministerial Level "Environment and Global Competitiveness", OECD. 28–29 April 2008. Paris.

OECD [2008d]: *Council Recommendation on Resource Productivity*. C(2008)40. Paris.

POMÁZI, I. – SZABÓ, E. [2006]: *A társadalmi metabolizmus*. L'Harmattan. Budapest.

SAHELY, H. R. – DUDDING, S. – KENNEDY, C. A. [2003]: Estimating the Urban Metabolism of Canadian Cities: Greater Toronto Area Case Study. *Canadian Journal for Civil Engineering.* Vol. 30. No. 2. pp. 468–483.

STANNERS, D. – BOURDEAU, PH. [1995]: Metabolism of City Prague, Czech Republic. In: *Europe's Environment: The Dobříš Assessment*. European Environment Agency. Copenhagen. pp. 278–280.

WACKERNAGEL, M. – REES, W. E. [1995]: *Our Ecological Footprint: Reducing Human Impact on Earth.* New Society Publishers. Philadelphia.

WACKERNAGEL, M. [1998]: The Ecological Footprint of Santiago de Chile. *Local Environment.* Vol. 3. No. 1. pp. 7–25.

WARREN-RHODES, K. – KOENIG, A. [2001]: Escalating Trends in the Urban Metabolism of Hong Kong 1971–1997. *Ambio.* Vol. 30. No. 7. pp. 429–438.

WOLMAN, A. [1965]: The Metabolism of Cities. *Scientific American.* Vol. 213. No. 3. pp. 179–190.

YAN, W. H. – LIU, Y. M. – HUANG, X. ET AL. [2003]: The Change of Urban Metabolism and the Effect of Waste Being Created of Shenzhen. *Cities Problem.* Vol. 1. No. 1. pp. 4–40.

YAN, ZH. – ZHIFENG, Y. [2007]: Eco-efficiency of Urban Material Metabolism: A Case Study in Shenzhen, China. *Acta Ecologica Sinica.* Vol. 27. No. 8. pp. 3124–3131.

YU, S. T. – HUANG, X. J. [2005]: Studies on Material Metabolism in the Regional System – A Case Study of Nantong City, Jiangsu Province. *Journal of Natural Resources.* Vol. 20. No. 2. pp. 212–221.

Reasons of Local Housing Market Price Differences in Hungary

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The article presents the examination of factors influencing local housing market price levels, carried out on a database of nearly two hundred Hungarian towns and the twenty-three Budapest districts.

The analysis is based on the simple assumption that local housing markets are more isolated than other goods markets. Consequently, the differences of local price levels may be explained by the various social, economic and geographical characteristics of settlements.

According to the results of calculations, even a quite limited set of indicators can effectively explain the differences of mean house prices. Of the available indicators, the local income level has a fundamental impact on house prices, whereas other factors, like mobility or tourism, have only additional effect.

KEYWORDS:
Housing market.
Market price.
Multivariate regression.

In 2007, Hungary joined a Eurostat pilot program that aimed at involving house prices in consumer price indices. Within the framework of this program, the national statistical offices were asked to collect owner-occupied house price indices, which are suitable for preliminary calculations. This requirement shed light on an old-standing debt of the Hungarian housing statistics, namely on the fact that the HCSO is unable to produce an official housing market price index at the moment. Our case is quite similar to that of many other post-socialist countries, where house price indices are not available either. Although almost all interested partners, like banks, investors, and real estate agents, try to make calculations for their own use, and even if the necessary information exists somewhere in some form, it is extremely difficult to make its statistical utilisation possible. The major problem with the available indicators produced by housing market actors is that they are generally restricted to certain submarkets or geographical areas and are usually carefully hidden from competitors and also from statisticians. In these circumstances, the EU requirement might be a useful reference to get better access to data files, to stimulate the statistical analysis of housing market data, to investigate the possible methods of index calculation, and in general to speed up the elaboration of basic housing market indicators.

1. General background, data sources

Data on housing market transactions are available from Duty Offices. Buyers of used dwellings pay 2-6 percent of the purchase price as stamp duty, and the information collected during the tax-office procedure is transmitted to the Hungarian Central Statistical Office. This data stock is now the only acceptable source of information on sales prices. Other possible sources of housing market information, such as data bases of property agents or banks, are inaccessible for statistical utilisation at the moment.

However, using Duty Office data has some disadvantages. One of them is that our data are limited only to the used dwelling market: the transactions of new dwellings are not registered by the Duty Office since new home buyers do not have to pay transfer tax. Besides, various techniques of tax avoidance reduce the quality of data. For example, it is quite common to state a lower price in purchase contracts in order to reduce the amount of tax. Moreover, the most valuable dwellings are owned by companies and their sales may remain unseen by the Duty Office. On top of it all, the

quality of data records is quite poor: essential pieces of information are missing, only the size, the street name and the building type of sold properties are known, and we only get the data records of towns. The fact that settlements with village status are excluded from the data transfer also implies certain restraints for the analysis. Fortunately, the situation is expected to improve in the near future since all data are transmitted to the HCSO hopefully with less missing details from 2007 onwards.

With respect to our calculations, tax avoidance results in underestimation of the price level, which - assuming that it is more or less constant in time - will not affect the price index. However, another problem, namely, the incomplete data stock appears to be more serious: many of the influential attributes are missing and this limits the accuracy of calculations.

There are many possible ways to calculate a house price index from a simple comparison of averages to the more sophisticated methods like the repeated sales- or the hedonic methods. Considering the characteristics of the Hungarian housing market, the hedonic method appears to be the most feasible solution to produce the house price index.[1] It is generally applied to produce price indices of products with many different characteristics. The fundamental idea of the hedonic price index method is that the prices of consumer goods – and also those of dwellings – depend on their usable attributes. Therefore, if the influence of quality changes is controlled, the 'pure' effect of the price level change can be determined. To obtain this, the impact of a series of characteristics (indicators) on property prices has to be explored by using, for example, a regression model. In the case of property prices, the most influential characteristics are perhaps the ones being in connection with the location, either in general, defined by the actual settlement, or in particular, meaning certain features of a neighbourhood. A very similar calculation was carried out when the results of the 1999 and 2003 Housing Surveys were processed. During these surveys the respondents were asked to estimate the market value of their dwellings. Then, based on their estimations, a regression model was set up to recalculate personal evaluations and to replace missing values. Both models proved that location had the most fundamental impact on prices.

In the following I concentrate on the general effect of the settlement characteristics on prices and examine the connection of the local property prices with the social and economic indicators of Hungarian towns and cities. Here, the examination of aggregated data of towns is focused on. The interconnections of individual data, which are generally the subject of the regression analysis of housing market data, are beyond the scope of this paper.

[1] For example, the low housing mobility of Hungarian households makes the repeated sales method inapplicable. According to estimations based on the 2003 Hungarian Housing Survey, an average dwelling is sold only once every ten years.

In the present study the sales data of 2006 were used and aggregated at settlement level. Then mean prices of all sold dwellings were calculated for 193 towns and for Budapest from the tax office data stock. These averages were taken as dependent- and the series of settlement-level indicators as independent variables. For Budapest the district level aggregates were used (twenty-three districts). Thus, the aggregated data file includes altogether 216 records.

As regards the independent variables, the statistical office produces hundreds of indicators of all Hungarian settlements, so actually the abundance of these possible explanatory variables presents a real difficulty. Obviously, a certain degree of correlation of the house price level is perceptible with almost all social or economic indicators, therefore it is quite important to consider beforehand what factors we seek and in what way they affect the local house prices. Moreover, these factors can not be fully isolated. As it will be shown, they are all interconnected in many ways, and though the statistical analysis may easily detect cause-effect relationships, we must be more careful with such interpretations.

In the following sections the settlement characteristics affecting theoretically the local house prices are reviewed, and the available indicators are assigned to them. The effects and interactions of incomes, income distribution, unemployment, population changes, mobility, geographical factors, business activity, tourism, demand for holiday houses and new dwelling constructions are also discussed.

It must be emphasized that the paper concentrates only on a single year and it is not intended to investigate the dynamics of prices or to consider dynamic effects on price formation. As housing market transactions are normally made within a few months, it seems reasonable to focus only on the actual characteristics and to neglect the long-term effects.

2. Incomes, income distribution, unemployment

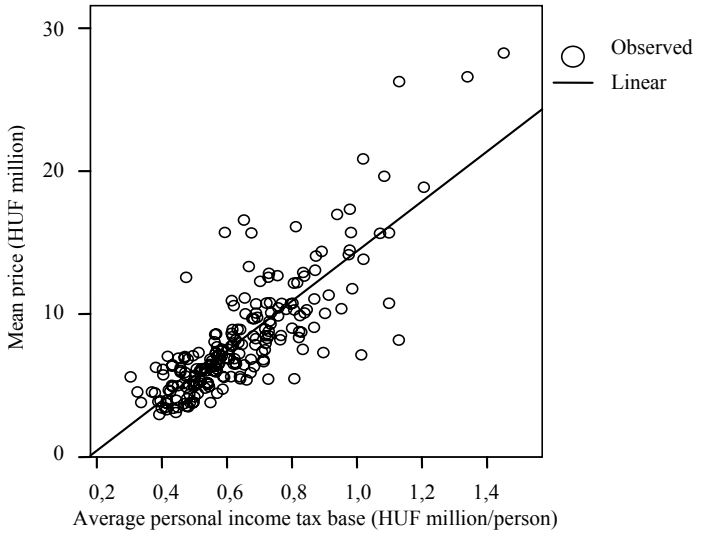
The idea that incomes affect house prices is quite evident. In the 2003 Housing Survey we asked the respondents to estimate the share of different income sources used in their property purchase. From this, we calculated the share of components within the total price. Accordingly, 46 percent came from the sale of other dwellings, 13 percent from family transfers, 28 percent from own savings, and another 12 percent from loans. It is quite general that family transfers are put up by selling the parents' home or a holiday house. This means that presumably more than half of the money spent on used dwellings is in fact the accumulated housing wealth of families, which therefore moves around within the housing sector.

Not only own savings but also loans can be regarded as sources connected directly to family incomes. The higher the income of a household, the greater its members' chance to get bank loans or subsidised housing loans (*KSH* [2005]). Consequently, at least 40 percent of the money involved in the housing market transactions may be closely linked with incomes.

The connection between incomes and house prices is perceptible at the level of aggregated data too: the plot of prices by average income proves the foregoing and depicts a strong positive linear relationship (r=0.82, b=1.74).

Figure 1 represents the idea that local housing markets are more or less isolated, and therefore the local incomes meet the local supply of properties and their balance sets the price level. According to this way of thinking, some outside effects may break the isolation of the local housing market in settlements falling far from the regression line.

Figure 1. The mean housing market price of Hungarian towns by per capita personal income tax base, 2006



Looking at the outliers in Figure 1, three groups can be separated. Each might be regarded as different examples of deficient isolation:

1. Medium or lower income level (HUF 0.5-0.8 million/person) with high property prices (over HUF 13 million): this group usually includes towns in resort areas, mainly in Lake Balaton region (Hévíz, Balatonföldvár, Balatonfüred, Siófok, etc.). In their case, apparently,

there is a substantial demand based on non-residents incomes, which results in higher prices.

2. Relatively high incomes with low prices: 'socialist industrial cities' with a large share of high-rise housing and a limited supply of better quality houses belong to this category. The demand for higher quality dwellings is generally supplied in the surrounding villages. Its typical example is Dunaújváros, where the industry together with the town itself successfully survived the economic transition. Now, the incomes are high but the demand for better housing can not be met within the boundaries of the town since it is built in with housing estates from the 1950s and 1960s. As a result of this situation, a real suburban ring developed around the town. This example also shows the limits of the settlement-level analysis: the administrative boundaries do not cover the actual residential community of the area, which is represented by the town's outlier position, too. Other examples of this type of outliers are: Tiszaújváros and Paks. In these towns the income tax base is between HUF 0.9-1.1 million/person, while price averages are between HUF 7-7.5 million.

3. Extreme incomes with top prices well above regression line: the most expensive towns in the Budapest suburbs and the three most expensive districts of Budapest (2nd, 5th, and 12th districts) fall into this category. In the latter ones the mean prices are above HUF 26 million while, for example, Szentendre and Budaörs are in similar position with somewhat lower prices (around HUF 20 million).

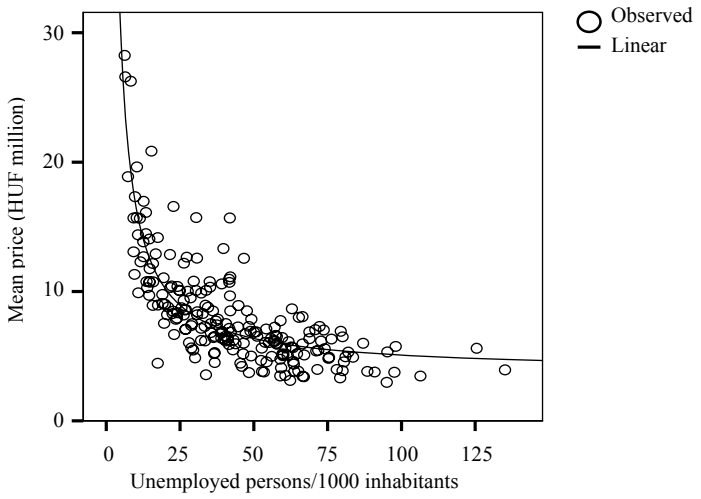
The effect of income inequalities on the housing market and housing conditions is again a field that has not yet been fully understood. The rate of unemployment represents at least some aspects of income inequalities, and for this reason may have a role in price formation. It must be stressed, however, that it is used in absence of a better indicator of income inequality.

The next figure shows that the higher the unemployment rate, the lower the price level is. According to the curve estimation, data are best fitted to an inverse line (R^2=0.69).

Not surprisingly, the correlation between the unemployment and income levels is quite high (r=0.82). Therefore it is useful to make it clear whether the unemployment variable provides any extra information, or we see exactly the same phenomenon, namely, the differences of average incomes via a different variable. The model calculation (see later) shows that besides income, the residual part of unemployment (which is not explained by mean incomes) also has a relevant contribution to the

model. Consequently, unemployment affects the local price level, which is independent of the effect of average incomes.

Figure 2. The mean housing market price of Hungarian towns by rate of unemployment, 2006



The outliers above the curve are towns in the Balaton region (Balatonföldvár, Siófok, Balatonfüred, Balatonalmádi, Balatonlelle, Keszthely), where the prices are higher than in other towns with similar unemployment rates.

3. Demographic factors, mobility

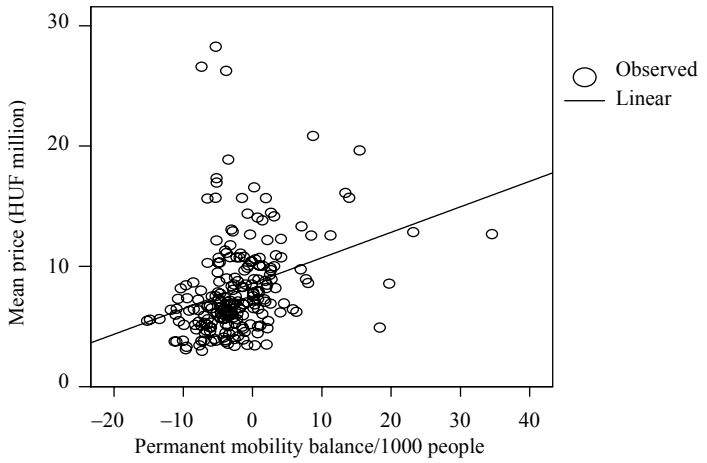
Residential mobility has a more perceptible connection with housing market prices than the total population change (r=0.31, r=0.22, respectively). In fact, the connection of prices with demographic changes is far more ambiguous than and absolutely not as unidirectional as the connection with incomes.

The 2003 Housing Survey reinforced that the share of moves (especially the ones to other settlements) is relatively low in Hungary. Generally, large social transformations are accompanied by increased mobility, as it was experienced after the Second World War or after the 1956 Revolution. Conversely, the 1989 transformation did not have such an effect. Mobility has remained constantly low ever

since then (*Dövényi* [2007]) and this might be an explanation for its weak influence on prices.

In this case, however, it is important to note that we can not generalise our observations for all settlements since we only have data of towns. However, based on available information, it can be assumed that normally moves influence prices. At the same time it is also typical that low prices attract poor families in segregated rural areas. Accordingly, the relationship is just the opposite in these latter cases: prices influence moves, and more than that, low prices may even generate population growth. Another association is also typical of underdeveloped areas: low house prices may limit mobility since the owners are unable to buy a flat elsewhere from the money they could get for their property (*Dövényi* [2007]). Figure 3 represents the uncertainty and weakness of this connection.

Figure 3. The mean housing market price of Hungarian towns by mobility balance, 2006



In 2006, only less than one-third of the Hungarian towns (or Budapest districts) had a positive mobility balance. A high level of mobility accompanied by high property prices is mainly the characteristic of the suburbs and resort areas accessible easily from Budapest, where both the effect of suburbanisation and the relatively new so-called sun-city phenomenon are perceptible. This latter one means that the better-off families move to the Balaton region after retirement (*Kovács* [2006]).

At the same time, there are also examples, where the positive mobility balance is combined with relatively low prices (presumably mainly in rural areas). Since mobility by itself has quite a weak influence on prices, it is often overcome by

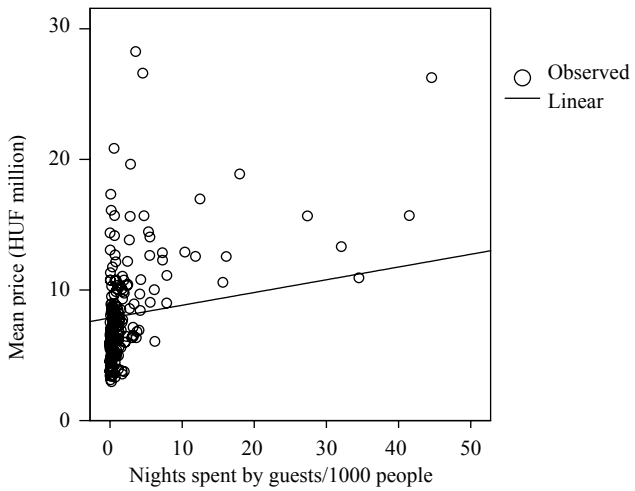
other factors having a stronger impact. If for other reasons the prices are low, it may generate moves of poor families. Therefore the direction of the relationship changes for the opposite. Low prices stimulate poor households to sell their valuable dwellings in cities and to move to cheaper areas either on the edge of the suburban belt or farther on. "‹Suburbanisation of the poor› can not be identified with the original concept of suburbanisation, but it should rather be understood as an escape from cities; however, they are both related concerning the directions of moves." (*Dövényi* [2007]).

4. Tourism

The resort areas have already been mentioned as examples of the positive permanent mobility balance. Apart from this, the incomes of non-residents also have an impact on the property market of these areas via the demand for holiday houses. Therefore the house prices are also expected to be above the regression line in resort areas. (See price level by mean income on Figure 1.)

To measure the role of tourism, the number of nights spent by guests per thousand people was used. Figure 4 demonstrates that there are only a few towns, where tourism has an effect on the housing market. In these cases a positive medium correlation (r=0.33) was experienced.

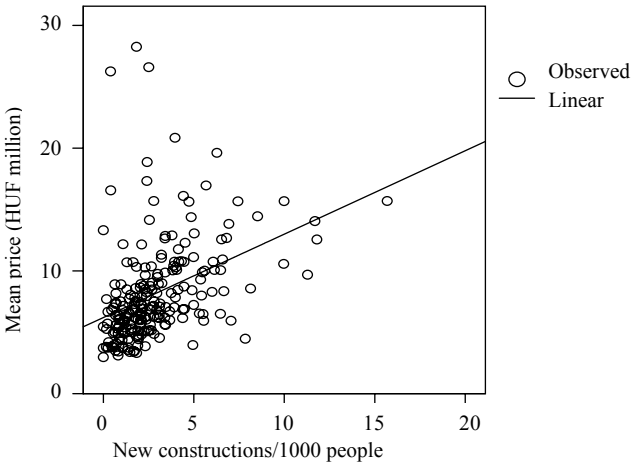
Figure 4. The mean housing market price of Hungarian towns by tourism, 2006



5. Connection with the market of new dwellings

Concerning the new dwelling market, the impact of the market of used dwellings works the other way around: high prices in the used dwelling market stimulate new housing investments. More precisely, the gap between the prices of building lots and those of new dwellings determines profits. It might be the reason that we find high investment rates in cheaper suburbs (with Szigetszentmiklós on the very top). Unfortunately, we don't have data on land prices at all, so we have no other choice but to check the connection of house prices with new constructions. (See Figure 5.)

Figure 5. The mean housing market price of Hungarian towns by new dwelling construction,2006

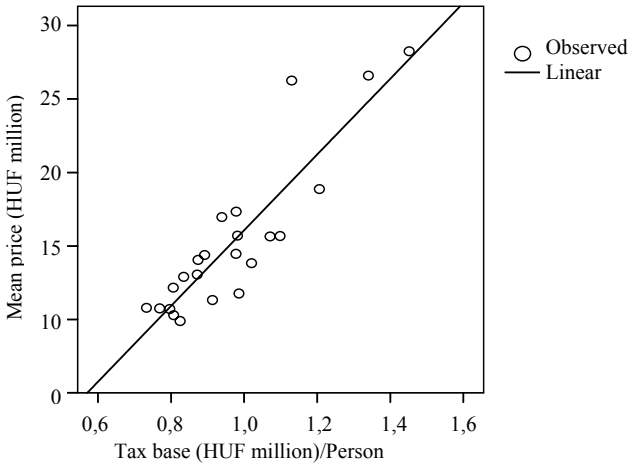


There is a medium correlation between the new constructions and the house price level (r=0.39). Unless a retroactive effect is presumed, involving the rate of new constructions in a regression model of properties might be questionable. Primarily the prices influence the investments, but the new dwellings may also have an impact on the used dwelling market via transaction chains. According to *Hegedüs* and *Teller* [2006], 100 new dwellings generated 140-150 further moves in the used dwelling market of Hungary in the period of 1998–2005. However, even if there is an effect at the micro level, we do not know how these moves influence the overall price level of settlements. In any case, using the rate of new dwellings might contribute to a better estimation. Therefore it has a place in price estimation models, even if its role in the explanatory models is doubtful.

6. The case of Budapest

In Budapest, the effect of incomes on house prices looks even stronger: the observations of the twenty-three districts fall closer to the substantially steeper regression line (r=0.89; b=2.58). (See figure 6.)

Figure 6. The mean housing market price of Budapest districts by per capita personal income tax base, 2006



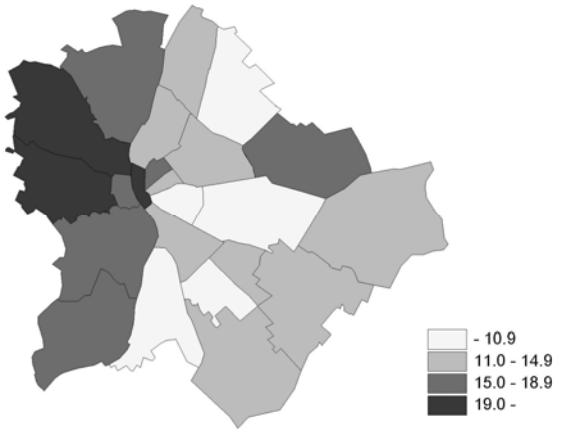
However, it is important to note that these districts are not isolated at all. On the contrary, moves to another district for the sake of a better environment or cheaper prices are more probable than moves from one town to another. The better areas attract the wealthy households from other districts, or the other way round, it is easier for low-income households to move to cheaper districts. Thus, in Budapest there is much rather a two-way connection between the housing market and average incomes. (Of course, the same can be observed between different neighbourhoods within other towns, too.)

In the previous figures, three points far above the others can be noticed. These points actually represent three districts of Budapest, the average price of which is at least around HUF 8-10 million more than that of any other district or town. (See Figure 7.) Two districts (2nd and 12th) of them are traditional upper class areas on the Buda side, a green hillside milieu of generally high housing quality. The third one is the city centre (5th district), where neither the housing quality nor the environment explains such extreme prices. But in this part of the capital, there is an enormous demand for offices, which is often met by converting dwellings to offices. According to the 2001 Census, only some 75 percent of dwellings were used for housing, the

rest were presumably offices, so "households" looking for dwellings have to compete with the business demand for offices.

The foreign investments also affect the property market of Budapest, which may further contribute to the higher prices.

Figure 7. The mean housing market price of Budapest districts, 2006
(million HUF)



With some simplification, all the price-raising impacts could be regarded as the "capital" effect. The following model calculations prove that a simple "yes" or "no" "Budapest variable" contains additional information not represented by any of the characteristics discussed earlier. Thus, neither income differences nor other variables explain fully the higher prices of Budapest.

7. The multivariate regression model of local price levels

To assess all the effects detailed previously, a linear multivariate regression model was developed. Its dependent variable is the average house price of settlements, the natural logarithm of which is used. (The logarithmic transformation makes the distribution of prices normal and will result in a better fitting model.) The independent variables are the previously introduced indicators in standardised form. Besides, some new variables are also introduced: one of them is the share of "bad" dwellings in the town (for example the ones without bathroom, sewage and toilet, with clay or wooden walls according to the 2001 Census) to represent the overall

housing quality, and the others are the dummies of geographical attributes, such as the Budapest agglomeration, statistical regions, Budapest and the Balaton resort area.

The calculations resulted in quite a strong model accounting for 85 percent of the variation of settlement-level averages, which is at least partly due to the fact of using aggregated data. The stepwise method involving variables in a way that their sequence depends on their partial correlation was applied. The final model included eight variables in the following order.

Table 1

Details of the regression estimation model of aggregated house prices, 2006

Model (Stepwise)	*R*	*R* square	Adjusted *R* square	Std. error of the estimate	Durbin–Watson
1	0.814	0.663	0.661	0.254	
2	0.862	0.744	0.741	0.222	
3	0.889	0.790	0.787	0.202	
4	0.898	0.807	0.804	0.194	
5	0.911	0.831	0.826	0.182	
6	0.914	0.835	0.831	0.180	
7	0.917	0.840	0.835	0.178	
8	0.919	0.845	0.839	0.176	1.818

Table 2

Coefficients of the regression estimation model

Coefficients	Unstandardized coefficients		Standardized coefficients β	*t*	Sig.
	B	Std. Error			
Constant	15.64	0.03		534.53	0.00
Tax base/person	0.17	0.03	0.40	6.35	0.00
Permanent mobility rate	0.09	0.02	0.20	6.06	0.00
Balaton region (dummy variable)	0.05	0.02	0.11	2.88	0.00
Inverse of the unemployment rate	0.08	0.03	0.19	2.88	0.00
Share of bad dwellings	–0.09	0.02	–0.21	–4.98	0.00
Budapest (dummy variable)	0.04	0.02	0.10	2.24	0.03
Tourism	0.03	0.01	0.10	2.98	0.00
Rate of new constructions	0.04	0.01	0.08	2.43	0.02

Note. Dependent variable: ln(mean price). Independent variables are used in standardised form. Excluded variables: Budapest agglomeration dummy, dummies of six regions.

Table 1 shows that the size of the per capita tax base remained the most influential attribute in the multivariate model. The higher rate of mobility, new constructions and tourism, as well as the location in the Lake Balaton resort area or in a Budapest district can cause an increase in property prices, whereas the growth of the unemployment rate and that of poor quality dwellings reduce prices. Actually, these are the only regional characteristics which in themselves have an effect on the market price level. All other variables were excluded from the model showing that the regional differences or the impact of the Budapest agglomeration had already been represented by other variables.

8. Conclusions

The foregoing analysis of the local housing market price level is based on the assumption that the available properties have to meet the available financial sources, and their actual balance determines the price level in the local housing market. This explains why local incomes can have a fundamental effect on prices. Even the interference of outside effects can be explained in this way as the available amount of money is raised by the extra-settlement demand both in the suburbs and in the resort areas.

Apart from the moves to the suburbs or resorts, the rate of mobility between settlements is generally low. This fact may contribute to the result that although only a few settlement indicators were used, a fairly good estimation could be achieved for the local price level.

The findings of this analysis may be used in the future price index calculations.

References

DÖVÉNYI, Z. [2007]: A belföldi vándormozgalom strukturális és területi sajátosságai Magyarországon. *Demográfia.* Vol. 50. No. 4. pp. 335–359. old.

HEGEDÜS, J. [2003]: *A SZJA lakáshitel törlesztéséhez járó adókedvezmény jövedelmi hatása 2002-es adóbevallások szerint.* www.mri.hu

HORVÁTH, Á. [2007]: Ingatlanár-indexek számításának módszertana. *Statisztikai Szemle*. Vol. 85. No. 3. pp. 213–239. old.

ERDÉLYI, D. – HORVÁTH, Á. [2007]: A lakóingatlan-árak emelkedéséről. *Külgazdaság*. Vol. LI. No. 9–10. pp 41–60. old.

ILLÉS, S. [2000]: *Belföldi vándormozgalom a XX. század utolsó éveiben*. HCSO-Demographic Research Institute. Working Papers 63. Budapest.

KOVÁCS, Z. [2006]: *A Balatoni Régió kitüntetett szerepe a hazai urbanizációban.* Paper presented at the Lóczy Lajos Balaton Summer School.

KSH [2007]: *Társadalmi ellátórendszerek, 2006*. Budapest.

KSH [2005]: *Lakásviszonyok az ezredfordulón.* Budapest.

HEGEDÜS, J. – TELLER, N. [2006]: *A lakáspolitika és lakásmobilitás kapcsolatának elemzése.* Városkutatás Kft. Budapest.